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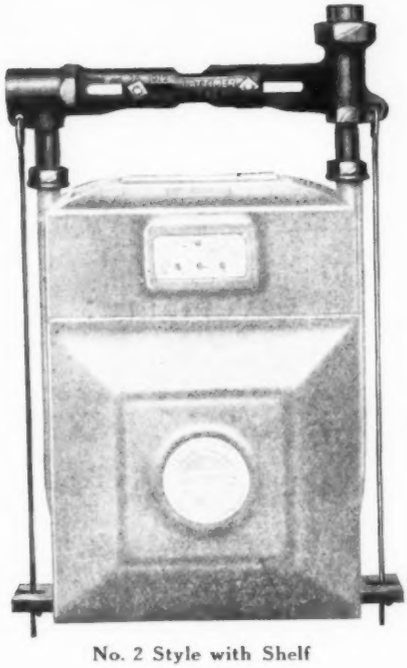

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Belgian-American Coke Ovens Corporation

THE BELGIAN-AMERICAN COKE OVENS CORPORATION has been recently organized as a United States Company. It has acquired all the patents and rights in the United States and Canada of the Franco-Belgian Coke Ovens Corporation of Brussels (Belgium) for the construction of the several types of Piette System By-product Coke Ovens and Recovery Plants.—

More than 1500 Piette ovens have been built and are in operation in several countries in Europe. Previous to the organization of the Belgian American Coke Ovens Corporation, a demonstration battery of Piette ovens has been erected at the coke station of the Laclede Gas Light Co., St. Louis, Mo., and is being successfully operated by the latter company after very minute tests and measurements of yields were made during thirty consecutive days.

Inspection of said demonstration battery is invited and complete information on the remarkable yields shown by same will be supplied on application.

The main characteristics of the Piette Ovens are:

The ovens are of the horizontal type with vertical flues, transverse regenerators and reversing arrangement. The construction is the simplest there is and the shape bricks are less numerous than anywhere else. The maximum of stability is attained by building the ovens proper on an absolutely rigid monolithic bloc.

The method of feeding the heating gas by regulation tuyeres enables a distribution at every point of the oven walls of the exact amount of gas required for a perfect coking.

The regulation sections for the control of the gaseous currents are calculated before construction and exclude the need of numerous dampers and sliding bricks.

The simplicity of the regulation has been exceeded nowhere.

The checkerworks of the regenerators situated in the longitudinal galleries are crossed transversely by either the waste gases or the air, securing the equalization of the temperature in the whole battery without preventing the isolation of any one oven in case of stoppage.

The arrangement of the galleries in the foundations realizes a superior cooling of the waste gas by the incoming combustion air besides reducing the loss of heat by radiation.

The BELGIAN-AMERICAN COKE OVENS CORPORATION is prepared to contract for the building of Piette By-Product Recovery Coke Ovens, with or without recovery of heat, also for plants for condensation and distillation of tar, production of sulphate of ammonia or concentrated liquor, recovery of benzol and carbolic acid, manufacturing of pure products: volatile alkali, benzene, toluene, xylene, naphthalene, phenol.

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The Present Availability of Oil Shale

Description of Steps Taken That Promise Real Aid

By FRANCIS P. WEBB, M. Inst. P. T.

It is not proposed to go deeply into the history of oil shale, or the past seventy years of its successful commercial eduction, but to attempt to point out its present position and future value to the by-product, oil and gas industries.

It is interesting to note, however, in the face of the many inspired articles that admit the value of our vast shale deposits, and which insist in the same breath that the dividend will accrue to the next generation, that in England the Anglo Persian Oil Company, Ltd. (of which the Government owns a major interest) has acquired the Scottish industry, a going concern, in its entirety, and has taken over large holdings in the maritime Province of Canada, which they are developing.

The Australian fields did much to help the gasoline and oil situation there during the late war. France is working hard at her deposits, although they are but a drop in the bucket compared with our own Western fields, and the German industry has been firmly entrenched for years.

We know that in the long run our natural oil supplies cannot keep pace with the constantly increasing demand; that our natural gas fields yield less and less as the pressure diminishes. Gas oils are becoming more expensive and the movement has already begun to replace water gas plants with straight coal gas apparatus, and while the world-wide search for new oil structures goes steadily on, the limits of the fields, so far as this country is concerned, are very definitely known and no graver warning could be sounded than the one in Mark Requas' report to the Senate in 1917 (while he was at the head of the Oil Department of the Fuel Administration), when he explicitly stated in his closing sentence that if this country could not find a new source for its lubricant and gasoline supply, it would soon be in the deplorable condition of a debtor nation.

Those who have followed closely the many claims made regarding the commercial development of oil shale will find this article well worth careful reading. While we are not in a position to give first-hand evidence regarding the actual status of oil shale eduction, we believe that definite advance has been made as described by Mr. Webb.—Editor.

Admitting that the lubricant situation is the most desperate, the need of motor spirits, gas oils, and one of the principal by-products, sulphate of ammonia, are all necessary to our industrial supremacy, and it would seem that the time was at hand to at least prove the feasibility of another supply from our great natural deposits of hydro-carbon shales both in the East and the West and from many of our low-grade coals that readily yield themselves to low-temperature practice.

The chief argument of the "next generation man" is that Scotch retorts are not fitted to our richer American materials, which fact is freely admitted in advance by those conversant with the situation and proved by at least two complete failures of Scotch methods of retorting in America. These should never have been tried, as experimental runs at Oak Bank and Pumpherston had already settled the question, but it does not follow that the problem is an impossible or even difficult one, and we believe that the plant of the Index Shale Oil Company, near DeBeque, Col., which has a retort designed by H. L. Brown, of Glen Ridge, N. J., (about 95 per cent completed) will do much to settle this debated question.

Of the older low-temperature retorts in use in the world, and there are many hundreds of them running and making substantial profits, the successful ones are nearly all vertical and depend upon gravity to force the material from the charge at the top to the discharge at the bottom, the rate of throughput being governed by the revolving grates, and as the material handled in each individual unit of the bench is limited to from six to eight tons per day of twenty-four hours, it follows that there must be a great duplication of individual units to get a production of even 1,000 tons per day, making a heavy capital cost for retorting alone.

The lowest estimates obtainable from responsible

manufacturers put these construction costs, at the lowest, at $1,000 per ton, and in the writer's opinion this may be compared with New York hotels that offer rooms "at $1 and up."

It is this knowledge of the first cost of certain vertical retorts that leads investigators to say "shale is good but a long way off," and to state that a 1,000-ton plant will need two and a half millions to start and that five millions would be better. These sums are staggering and at the present time, with our post-war financial conditions to face, prohibitive to the sources that would ordinarily be interested from a purely financial standpoint in a new industry that holds such great and certain results.

The immediate need, then, of making our shales and low-grade coals available, is a retort of such great throughput per unit, that the construction cost per ton of material is brought down very materially from that of the older apparatus in general use elsewhere.

From the experience of the industry in the past, several axioms may be laid down:

(a) That the throughput of the vertical apparatus, gate controlled and depending on gravity to force the material downward, is limited to a few tons per unit, necessitating much duplication.

(b) That moving parts in the heat zone have not proved practical.

(c) That the horizontal retort with a positive feed, but with the objection noted in (b) eliminated, is the correct answer.

(d) That the distils from shale, if properly made, can be split at a commercial profit so as to yield a variety of valuable fractions.

Our own tests show

(e) That the residue from our Western shales has a value

Many horizontal retorts have been tried and found wanting. The European ones have pinned their faith in the past on the Archimedes screw or helical conveyor to move the material from end to end—the retort being sometimes horizontal and sometimes inclined to as great an angle as 45 deg.

Where the conveyor fills the tube, two objections are noted; first, the moving part in the heat zone, and, second, the tendency of the screw to divide the interior space into small sections, so if there is any intumescence or sticking, at any stage, instant trouble arises. This compels small feed and reduces throughput and shows no advance over the simpler vertical retorts which produce good oil.

The horizontal or inclined retorts so far built in Colorado, depend on scrapers to pull the material from end to end, and again introduce the objectionable feature of moving parts in the heat zone, and in most cases demand fine grinding to secure the best results. The writer's opinion is that this feature alone is prohibitive on account of the added expense.

New Retort Is Tubular

On the other hand, the retort at the Index Company, now nearing completion, is tubular, horizontal, with a positive feed, but with no moving interior parts. It is constructed in three sections with stuffing boxes between, and one or more sections can be either dropped or added as practice or the results desired, demand.

The material charged is broken to pass a six-inch ring, eliminating all fine crushing, and is carried forward as the retort itself revolves by a fixed device, which, while ample to move the shale steadily on its way, leaves a clear center space, preventing any sticking or bridging, and the combined effect of tumbling and heat is that of a ball mill, breaking up any hydrocarbon material treated very quickly and delivering the residue in a finely powdered form. Commercial uses have been found in advance for this shale residue.

No new mechanical principles are involved in this simple apparatus, but rather a clever combining of old and proved practice.

The capital cost per ton, based on the unit now nearly finished, can be stated, not to exceed $350 per day ton, and will be reduced in future installations.

This cost is so far below other apparatus and present use that it opens up vast possibilities.

The throughput and other data are based on a ten months' run of a small retort which, although purely experimental, proved to have a capacity of twenty-five tons a day, which took it quite out of the class of ordinary pilot apparatus.

Finally, the chief points claimed, and which the writer believes are fully justified, are

(a) Greatest throughput known, which makes the low capital cost per ton of material handled.

(b) The greatest flexibility at all stages, and perfect heat control at all times. This allows ranges of distillation that will appeal at once to the oil and the gasman, as the practice may be so regulated to produce the maximum either way, and the same retort will handle a large variety of material.

(c) Gases are taken off from each section as made, which is in the line of good practice, and at the stuffing boxes steam curtains are introduced preventing the gases from the various stages entering other zones.

(d) The residue is delivered in powdered form and can be carried to a calcined state or finished with fixed amounts of hydrocarbon still in it.

Note.—The coals treated so far are also reduced to a fine state, much as the shale is, and if they are to be used as a smokeless fuel, will have to be briquetted.

The condensing apparatus designed for this retort is very interesting and some remarkable results have been obtained, but any form of condenser may be used, and this article aims to keep one point clearly before the reader, and that is, shale is practical now, not twenty years hence, with a retort that will turn out acceptable distils at a small capital distillation cost.

The condensing and refining of the products come under the head of well-known and proved practice abroad, if not here, and can be safely left in their own province.

What May Be Expected

In 1920 a very carefully cut average sample of Colorado paper shale was taken to England for check analysis and examined by many experts with the

(*Continued on page* 282.)

Mammoth Holder Goes Into Service

Astoria Light, Heat & Power Company Makes Big Installation

The last drop of 14,200,000 gal. of water, which had been flowing all week from an eight-inch main, gurgled into the immense 15,000,000 cu. ft. gas holder of the Astoria Light, Heat & Power Company at Astoria, L. I., on Saturday, September 24. Two small snub-nosed punts and a flat-bottomed rowboat took a parting look at the light of day before the last steel plate and the last manhole covers were bolted down and they began a long sentence on the Stygian black lake, 300 ft across that fills the tank of the gas holder and under the equally inky black dome that represents the crown.

A circular pool, 300 ft. across, is no inconsiderable ducking pond, as the small urchins of Astoria discovered last summer when excavations were begun upon the pit that was to hold the 1,200,000 lb. of concrete and 1,000,000 lb. of steel reinforcements that went into the bottom and retaining wall of the new gas holder tank. The flooring of the tank, which is laid on the bed rock, is possibly not over eighteen inches in depth, but the cylindrical wall, which must withstand the weight of forty-eight feet of water, is nine feet thick at the bottom and five feet thick at the top; it stands fifty feet high and is constructed of the above-mentioned couple of million pounds of steel and concrete.

There are two reasons why this story is published in these columns: First, because it is of real interest to the gas industry, and, second, because it is a splendid type of story for interesting the public. You will find it instructive from both angles.—Editor.

Within the concrete tank rest the sections of the holder, huge cylinders of 5/32-in. steel plate, forty-eight feet six inches high. There are five of them. The inner one, known as the crown section, carries the steel dome that forms the top of the holder. Its plating varies from 3/16 to 1⅛ in. in thickness from center to circumference and the center of the dome rises twenty-four feet above the edge of the section to which it is attached. The compression developed at the edge by the lifting power of the gas upon the bulging crown amounts to 1,000 tons. To withstand this tremendous pressure and prevent the edge from crumpling like a paper cup, the joint between the dome and perpendicular section is reinforced with a massive curb, trussed on the inside and strengthened with heavy plates on the outside.

Substantial and earthbound as this structure looks, it is really very light in comparison with the tremendous lifting surface which it exposes to the gas, some 60,000 sq. ft. Were a sufficient number of rubber tubes run through the water and under its edge and a sufficient number of persons, with no more than average chest expansions, asked to blow into the tubes, it would slide up its guide frame with a great deal less exertion on the part of the blowers than a small boy exhibits in puffing up a paper bag. The pressure which the holder exerts upon the gas is but ⅝ of a pound to the square inch. Any pressure of gas or air greater than this will inflate it. The total weight of steel in the crown, sections and guide frame of the Astoria holder is but 4,000 tons, no small proportion of which is in the guide frame which is attached to the edge of the concrete tank and is not lifted by the gas.

Not only is the holder itself comparatively light, but it is top heavy. When buoyed up by the gas the crown section, if it had free play, would immediately turn turtle. Set as it is inside the other sections and tank it would wedge itself, doing irreparable damage to itself and them. To prevent this, a shelf is constructed around the inside lower edge of the perpendicular side of the crown section, on which are bolted an unbroken series of 700-lb. concrete weights, 1,200 in number—multiply it yourself. This additional 800,000 lb. placed at the lowest possible point on the crown section lowers its center of gravity below its center of buoyancy, thereby putting it in stable equilibrium as a floating body. As the holder is inflated with gas and the inner section rises to the point where the cup which runs around the lower outer edge of its side engages the grip which runs around the upper inside edge of the next section, and lifts that section, the stability of the whole is further guaranteed by goose-neck arms which bear upon the uprights of the guide frame with rollers and keep the floating crown and each of its dependent sections at an even distance from the sides of the tank and from each other, and also make it impossible for them to rotate—not an improbability—as both they and the tank are perfectly round.

Holder Is Fragile

Furthermore, besides being both light and top

heavy, a gas holder is fragile. Despite its elephantine and monstrously substantial appearance, it is not unlike a gas balloon, except that, unfortunately, it is inelastic and, instead of contracting when not inflated, would crumple. It could not stand up by itself. The side sections sitting up on their edges and protected and braced by the tank which is as solid as the rock itself, might do well enough, but the crown, if uninflated and unsupported, would cave in. To prevent this, the framework upon which, in the course of construction, the crown plates are laid, and which is therefore exactly the proper shape to support it, is allowed to stand on the floor of the tank permanently. Although made of wood, it lasts indefinitely, being entirely unexposed to the air. The lower part of it will stand in the water, also a permanent fixture in the holder, and the upper part will be in the gas, which is not detrimental to wood. When the holder is inflated the gas supports the crown just as it would distend the rubber of a toy balloon; when the holder is deflated the more or less flexible crown drops down and rests upon the framework.

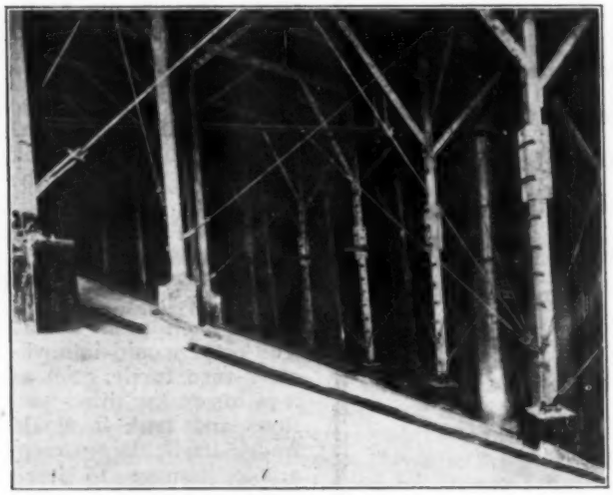
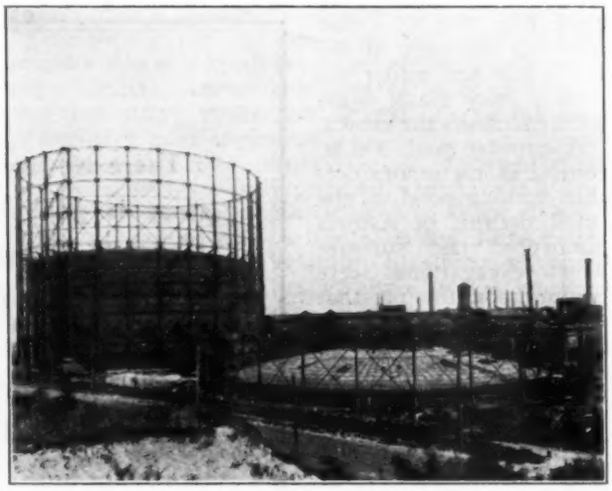


Photo taken inside 15,000,000 cu. ft. gas holder on the slanting side of the cone, and showing at right two of the four gas mains. These mains are each 4 ft. in diameter. Two will be intake and two will be outlet mains.

All of the foregoing data led to the conclusion that the designing, erection and adjustment of a 4,000-ton gas holder, capable of holding 15,000,000 cu. ft. of gas without leakage, made so light that it would collapse if unsupported, and yet so heavy that any misadjustment would cause it to rip itself apart, is no simple problem. It is vastly more complicated and delicate than the job of erecting a rigid and immovable steel tank, such as is used for storing oil. The fact that the holder is in almost constant motion and that that motion must be free and smooth, as well as accurately regulated, makes miles of engineering difference between the building of a great gas holder and the building of any other kind of steel structure.

The job of building one of the largest gas holders in the world, the other largest is the twin of the newly completed holder and stands alongside of it at the Astoria company's plant, is considerably more than the cutting out of the steel plates and riveting them together with 2,500,000 rivets, the number used at Astoria. The new holder cost the Astoria Light, Heat & Power Company the neat sum of $1,500,000.

This is in spite of the fact that they were able to economize very materially in the early stages of the construction, owing to a favorable location. The bed rock lies near the surface at the point chosen for the holder. The excavation necessary to give a circular pit 300 ft. across and 50 ft. deep would have amounted to something between 300,000 and 400,000 cu. yd. But it was not necessary that the tank should have a flat bottom. The construction engineers therefore confined their digging operations to a circular trough fifty feet deep and wide enough to accommodate the nine-foot concrete wall of the tank and the telescoped sections of the holder, which had to rest inside the wall. Inside this trough they left the native rock standing in the shape of a high cone, cut



Showing a completed 15,000,000 cu. ft. gas holder and its twin, now completed at a cost of $1,500,000

off flat on the top. The circular flat top of this cone is 100 ft. in diameter and the incline which runs down to the trough is 146 ft. long. In this way the excavation was reduced to about 200,000 cu. yd. The bed rock was covered with a comparatively thin layer of cement and the structural frame work to support the crown of the holder, both while it was being made and afterwards, was erected upon the cement-covered cone. A secondary economy occurred here as the supports needed were much shorter.

And now re-enter the boats. Before the water was let into the tank they lay upon the top of the cone, where they had their pictures taken. As the water level is some three or four feet above the top of the cone they are now afloat but not adrift. Each one is tied directly under one of the manholes in the crown. Workmen will be let down through the manholes, the lids replaced, and the holder blown up, with air, not with gas. As the crown section rises above the water there will come into view the rollers set below its lower edge extending out beyond its circumference to bear against guide tracks on the inside of the next section. These rollers have to be adjusted. Then the holder will be blown up some more, the next section will be lifted and its rollers will come above the

(*Continued on page* 284.)

What Goes On in a Water-Gas Machine?

A Question That Is Easier Asked than Answered

By M. E. BENESH

The Peoples Gas Light and Coke Company, Chicago, Ill.

The question "What goes on in a water gas machine?" is easier to ask than to answer. Yet it is met daily by those responsible for the operation of water gas plants, though it may not always be recognized in all of its many forms. Concerning the water gas machine the plant superintendent's duties appear, in general, to present problems of two kinds—first, those incident to operation of present equipment—second, those concerned with changes in equipment to increase efficiency or capacity. Each of these problems presents some form of the question. The desired alterations which each works manager has carefully planned are very important; but when these alterations are made, his other problem—to operate with the existing facilities so as to realize the best possible economy—will no less than before stare at him morning, noon and night. It is with this latter, more frequently occurring, phase of the question that this paper is concerned.

Here is a paper that will be presented at the American Gas Association convention in Chicago next November. We are of the opinion that there will be quite a lot of discussion following the paper's presentation.—Editor.

It may be a platitude to say that the problems involved in the process of manufacturing carbureted water gas are exceedingly complex, for every plant manager fully recognizes this fact every day. He contends with it because the complexity of the process extends beyond the theory of design and involves every-day practice. This is a condition different from that met in many other industries.

The gas industry is similar to the electrical in the matter of complexity in the process, but this intricacy does not cease to be actively involved when a machine is built. Instead, the channels for complication of any attempted observation seem to grow. This difference is probably due to the slight change in the complex nature of the energy; i. e., the fuel supplied and the gas produced are both highly complex in form. Furthermore, the fuel available is always changing, and for any given fuel in the machine, the gas-producing characteristics of the fuel bed are ever changing throughout the period between cleanings, between chargings, even every second within the individual run.

The intricacy of the process of making carbureted water gas is natural, for it combines and interrelates two processes, each of which is broad enough for a life study: the making of blue gas and the cracking of oil. These two fundamental operations are affected by a very large number of closely interrelated and continually varying factors, which make carbureted water gas machine control a never-settled problem. In a comprehensive summary of fundamentals of the carbureted water gas process, R. B. Harper* has distinguished 289 factors and, as he remarks, the list does not exhaust the subject.

Let us see how changes in operation are reflected in the fuel bed. To consider each of the 289 factors separately, as far as possible, is ideal for research study; however, since we are interested in the practical and economical operation of existing equipment, it might be better or more expeditious to accept the results of such a survey, and review, in general, what goes on in a gas machine for purposes of practical operation.

Heat Distribution

Neglecting secondary factors, the proper average fuel bed temperature is determined by the heating value of the gas to be produced, and the available rate of primary air or generator blast input. Throughout this discussion we will assume that the equipment and factors of operation not mentioned as changing are at the time to remain constant. The amount of heat which must be supplied to the checker chambers by the burning of coke during the blow depends on the amount of oil gas to be made there, while the amount of heat which must be supplied to the generator during the blow depends on the amount of blue gas to be made with the given excess steam. Therefore the heating value standard of the gas produced, which determines the relative amounts of oil gas and blue gas in the finished gas, will determine the relative amounts of heat to be stored in the generator and the checker chamber; i. e., the heat distribution or balance to be maintained. The method of operation assumed in this discussion is such that a predetermined temperature is maintained in the checker chambers, with a

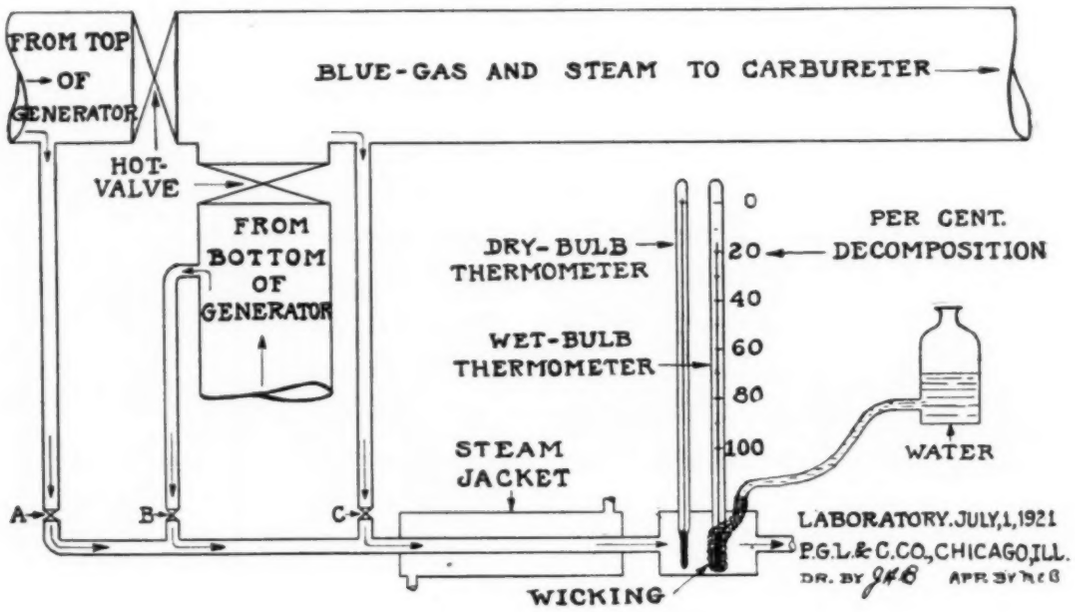
*"Some Gas-Machine Factors Involved in the Manufacture of Carbureted Water Gas," by R. B. Harper. Proceedings of the Illinois Gas Association, Vol. 15, 1919, page 147.

minimum amount of free oxygen and no notable quantity of carbon monoxide leaving the set during the blow. These conditions are demanded by economy. Not to conform to the first is to waste gas oil, to neglect the others is to waste generator fuel. But if, as we suppose, no carbon monoxide is to escape from the set during blasting, then the relative amounts of heat supplied to the checker chambers and the generator will depend on the average percentage of carbon monoxide in the gases leaving the generator, which in turn depends on the rate of primary air input and on the temperature of the fuel bed—being higher for high temperatures and low rates of primary air input. Therefore for a given heating value standard there is a certain relation between the quantity of heat to be stored in the checker chambers and the generator; for this ratio there is a certain average per cent of carbon monoxide to be maintained in the gases leaving the generator during the blast; and for this per cent of carbon monoxide (the rate of primary air input being given) a certain mean fuel bed temperature must be maintained.

While mean fuel-bed temperature is spoken of as a constant, it is, of course, known to be constantly and rapidly varying in a somewhat regular cycle. By mean temperature is not meant the statistical average temperature, such as might be obtained by averaging the actual average temperature of each piece of generator fuel, but rather the effective temperature, as measured by the power of the fuel bed to produce carbon monoxide during the blow and decompose steam during the run. The exact conditions which affect this power of the fuel bed are perhaps obscure, involving such factors as catalytic action of ash or clinker, nature and size of fuel, fuel distribution, etc., but it depends essentially on the temperature of the hot zone of the fuel bed, where the great bulk of the chemical action takes place. In this discussion, by defining fuel-bed condition by the per cent of carbon monoxide it produces for a given air rate, noting that a given per cent of carbon monoxide corresponds to a certain steam decomposing power, we will avoid consideration of the actual temperature involved.

When Blue Flame Appears at the Stack

If at any moment the fuel bed is hotter than normal, the operator will find that his checker chamber temperature is rising, and blue flame is appearing at the stack. He must shorten the blow, while on the succeeding run the hotter fuel bed will decompose steam more effectively and therefore fall in temperature more rapidly than usual. On the other hand, if the fuel bed is too cold, the operator must blast longer, while the steam will cool it less. The fuel bed will therefore always work back toward its normal average temperature.



DIAGRAMMATIC SKETCH OF WATER-GAS INDICATOR
— PAT. APPL'D. FOR —
WITH CONNECTIONS FOR TESTING HOT-VALVE

The factors considered are not the only ones which may change the heat distribution; for example, a good grade of gas oil contributing more B.t.u. per gallon will require less heat in the carbureter and result in a lower mean fuel bed temperature than a poor oil. Again, the use of a much higher rate of steam input to the generator would lower the average per cent of steam decomposed; and every cubic foot of blue gas produced would require a little more heat from the generator than before the increase in steam rate. A larger proportion of the heat stored in the set during the blast would be required in the generator. This means a reduction in the percentage of carbon monoxide in the gases leaving the generator during the blow, which in turn requires that the average fuel-bed temperature should fall, since the generator blast air input rate is constant and no carbon monoxide is burned at the stack

Carrying a thinner fuel bed has the same effect as increasing the generator blast rate, since it reduces the time of contact of air and coke. This means that the fuel bed will at first retain a larger portion of the heat produced by the primary air and consequently of the total heat stored in the set, and in order to overcome this and restore the heat distribution to normal, the average fuel-bed temperature must rise.

Experience with bituminous coal confirms the same line of reasoning; in fact, because of the small quantity of heat required for oil cracking and the large amount available for same, both capacity and thermal efficiency are low with ordinary operation.

What happens when a change in operation is necessitated by quality tests will serve to exemplify a common procedure in gas-machine operation. Let us consider what happens when we lower the standard of heating value to such an extent as to necessitate, for example, 20 per cent reduction in the oil required per cubic foot of blue gas. The gas maker, who has found by experience what is the proper length of blow and run to maintain a balance with the conditions previously obtaining, reduces his oil by 20 per cent and leaves everything else as before. As a result the checker-chamber temperature will begin to rise. If he closes the secondary air valve when the pyrometer shows the proper temperature, a good deal of flame will appear at the stack. He will therefore find it necessary to shorten his blowing time or lengthen his time of steam input. Either course will lower the temperature of the fuel bed, and the set will gradually get back to balance.

But when everything in the set is in harmony again, he will be told that the calorimeter shows too high a heating value. The reason is this: the fuel bed at its new lowered mean temperature will not decompose the steam with the same efficiency, and the generator's production of blue gas drops off. The oil input, being computed for the full former production of blue gas, is too high; and a further reduction in oil must be made. This will lead to a further small adjustment in the balance; and the set, besides producing a lower heating value gas, will also be producing a decidedly smaller quantity of gas.

Usual Method of Fuel-Bed Temperature Control

From the foregoing it is apparent that there is a certain fuel-bed temperature which is correct for the condition of any given machine and no other temperature is so economical. This correct fuel-bed temperature, in general, will be different for every set, since it depends on the fuel used, radiation losses, kind of oil, steam input rate, etc., each of which factors vary; but at any instant there is some condition toward which a properly operated machine must be tending. How closely does the gas maker keep to this condition? In practice, though on the average he keeps around the proper mark, he is constantly wandering away from it, returning, overstepping the mark, returning again. A sensitive recording pyrometer chart illustrates graphically the variations of one factor, the checker-work temperature. The gas maker is always in the neighborhood of the line, seldom closely along it; and just as frequently as he oscillates from this correct temperature he incurs waste of materials. The magnitude of these individual losses may, under ideal conditions, be small; yet the inevitable fact that they are continually repeated makes the total loss mount to a very considerable sum.

The reasons for these variations are quite apparent. In the first place, the correct condition itself changes as the factors affecting it change. Gradually (and at times rapidly) the checker-work plugs up and reduces the air input rate; between clinkering periods the clinker formation is ever changing the fuel-bed depth, which latter also changes materially within each charge; the generator fuel and oil change, etc.

In the second place—and this is by far the most important reason for the variations—the gas maker has only very crude means of knowing whether he has taken out of the fuel bed all that was stored there during the blow. In practice he continues his cycle in the first instance by time; he blasts so long and runs so long, and experience shows this to be about right. But suppose his steam input rate temporarily drops 10 per cent. This will scarcely affect the average correct fuel-bed temperature, but it will materially raise its actual, though temporary, temperature; and the effect will be cumulative, though it may not be very evident to him until the fuel bed condition is far from normal.

This brings up to the third reason why variations from normal temperature occur—the lapse of time before a change in fuel-bed condition becomes apparent. The checker-work has a large heat capacity; pyrometers have some lag: the result is that by the time attention is called to a wrong condition it has made a good deal of headway.

The actual control of the heat distribution in a set is accomplished by means of the pyrometers and observation of blue flame at the stack, the latter at intervals supplemented by stack gas analyses and a look at the fuel bed. These are, to be sure, in the long run, exactly the conditions that must finally govern; but they are slow and do not give close regulation, nor do they show clearly to what extent variations have occurred.

Measurement of Fuel Bed Condition

The desirability of determining the condition of the fuel bed, especially as to its steam decomposing power, is thus evident. Hitherto, however, very little has been possible in this direction. Where there are a number of machines operating it is a practice in some plants to check the steam input rate by an analysis of the blue gas—high carbon dioxide content being ascribed to excessive steam input rate. The method has obvious disadvantages. It is not continuous, is generally used for selected runs only, and involves a good deal of careful work. But, most important of all, carbon dioxide content is only a very imperfect indicator of fuel-bed condition. Some of the most careful and accurate work done on water-gas problems—that of the Bureau of Mines*—shows that, with a hot fuel bed, large changes in decomposing properties take place with only small changes in the carbon dioxide content of the blue gas; whereas, with a cooler fuel bed, a very small change in the decomposition will affect the carbon dioxide content greatly. Thus at the start of a run the percentage of carbon dioxide in the blue gas will change little while the decomposition is dropping rapidly, but toward the end of the run the reverse is true—decomposition is nearly constant and the carbon dioxide

content is increasing rapidly. Moreover, each different rate of steam input means a different relation between the temperature of the fuel bed and the carbon dioxide content of the blue gas. Thus, for example, at 1,200 deg. Cent. (2,192 deg. Fahr.) when the steam was in contact with the coke for one-half, one, and two seconds, the carbon dioxide content of the blue gas produced was 12, 5½, and 1 per cent by volume respectively.†

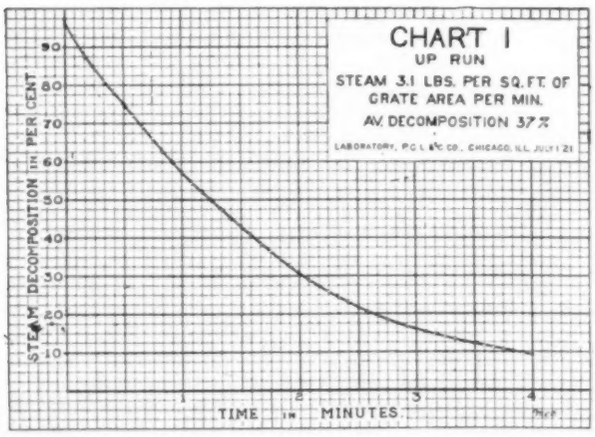
It seemed possible that, if the widely varying factor—the percentage of undecomposed steam—could be determined in the blue gas, these difficulties could be avoided, and a more immediate index of what goes on in a water-gas machine realized. The accompanying charts were obtained by a method developed out of this idea. A brief description of the means and method of obtaining them may permit a more ready grasp of their true significance. The apparatus, which has been named "The Water-Gas Indicator," records or indicates continuously the production and fuel-bed condition of a carbureted water-gas machine and it does this by giving directly the percentage of steam decomposed by the fuel bed.

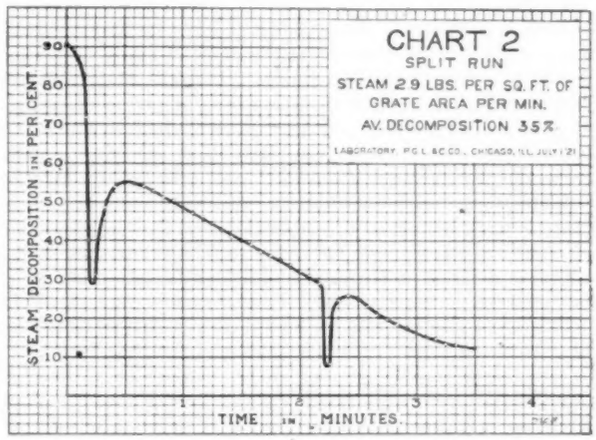
The Water-Gas Indicator

The means for continually indicating the percentage decomposition of steam is shown diagramatically in the accompanying sketch, which is self-explanatory as to construction. The underlying principle of the method is that of the familiar wet-bulb thermometer used for atmospheric humidity determinations. In the application of this principle, simplicity is obtained by having a constant dry-bulb temperature, making possible the graduation of the wet-bulb thermometer in per cent decomposition of steam.

The determination is made on the partially decomposed steam leaving the generator. For this purpose a sample of the mixture of blue gas and steam or water vapor is taken from the generator-to-carbureter connection, at a point beyond the hot-valve, and is first screened to remove the breeze. In the sketch this operating sample line is controlled by cock (C). To assure that the mixture reaches the indicator without condensation and at a practically constant temperature, the sample line is steam jacketed. This constant temperature (212 deg. Fahr.) is indicated by the dry-bulb thermometer.

*†"Essential Factors in the Formation of Producer Gas," by J. K. Clement, L. H. Adams and C. N. Haskins. Bureau of Mines, Bulletin 7.





The temperature indicated by the wet-bulb thermometer depends on the water vapor content of the mixture. If the gas passing the wet bulb is perfectly dry, as would be the case if the steam were 100 per cent decomposed, the wet-bulb thermometer, due to the evaporation of water from the wicking, would register more than 100 deg. below the dry-bulb temperature. Again, if the steam were not decomposed at all, saturated steam at 212 deg. Fahr. would be passing the wet-bulb thermometer, no evaporation would take place, and the temperature registered would be that of the dry-bulb—212 deg. Fahr. At any intermediate percentage decomposition there will be a certain corresponding wet-bulb temperature which may be calculated from theory—or, better, determined empirically. The wet-bulb thermometer is more convenient when graduated as previously suggested—not in degrees but in per cent of steam decomposed.

Since the indicator measures the percentage of steam decomposed, an indicator, together with a steam meter, gives a measure of the blue gas produced. And when the quantity of blue gas produced is known, the total purified gas produced is also known with a reasonable degree of accuracy. The volume added to the blue gas by the oil is, of course, a somewhat variable quantity, but is usually only a small part of the purified gas; moreover, where a constant heating value standard is maintained this variation must be moderate. Though the exact volume added by the oil is a hard quantity to measure, we know, for example, that for gas of 530 B.t.u. it is approximately 20 per cent of the total. And, if we allow 20 per cent variation of the oil gas—which would seem to be a liberal estimate, for it roughly corresponds to one-half gallon of gas oil per thousand cubic feet of gas—the extreme error in the readings of the indicator would be 4 per cent. The indicator is therefore a production meter for individual machines, sufficiently accurate for practical purposes.

Explanation of Charts

The results shown in the curves were obtained with a specially blown, long-bulb mercurial thermometer

(*Continued on page 283.*)

Selling the Service Charge

What Must Be Done to Convince Consumers

By J. E. BULLARD

It seems almost impossible that people who at least appear intelligent should so often take the attitude that they do toward the service charge that gas companies are coming more and more to charge. These same people will take it for granted that it is perfectly proper for the electric light company to make a service charge, and then turn right around and accuse the gas company of being unfair when it makes a similar charge. One would naturally expect that after the electric light company has once sold the idea it would be an easy matter for the gas company to adopt it, and that the people would accept it as fair. This, however, does not seem to be the way that it works out in practice.

Here is an interesting discussion of the service charge, that much-mooted question that is disturbing the peaceful sleep of many gasmen. We don't believe too much can be written or said on the subject, for eventually it must come. But it will come only with education.—Editor.

It seems to be necessary for the gas company to do for itself all the work that electric light companies have done for themselves. Accordingly, it may be well to pay a little attention to the course that was pursued by the electric light men.

The very first step in the electric light business, and by far the hardest one to take, was the selling of the idea to the men in the business. Not until electric light men themselves could see the advisability or even the necessity of the service charge was it possible to accomplish very much in a big way.

In this work it was necessary to make these men understand what the service charge really is, and to persuade them to base this charge upon actual cost; that is, make the service charge serve the purpose for which, in theory, it is for. In other words, to make the service charge actually cover, in so far as possible, the actual fixed charges.

Perhaps the fact, one might say, that gasmen have not yet come to a full realization of the importance of the service and the necessity of basing this charge on actual costs and making the rate accordingly has had a great deal to do with the opposition on the part of the public. When the service charge is added merely as a means of securing a higher rate, the consumers seem quick to sense this fact.

In too many cases the service charge means little else than a scheme for increasing the revenue. It is not a scientifically-worked-out charge. The best evidence of this is when, as is far too often the case, the same charge is applied to all classes of customers, regardless of their size. Now, the service charge is designed primarily to cover the fixed charges, the overhead expenses that are necessary so as to be ready at all times to serve a customer. It is perfectly apparent that this charge is not the same in the case of a customer with a hundred-light meter installed as it is with a five-light meter installed. Electric light companies base their service charges upon the capacity of the installation. Gas companies must do the same if they are to overcome the objection to the service charge.

This means that instead of making use of the service charge to increase revenue merely, it must be used actually to cover the overhead expenses. The grand total of all the service charges of all the customers should equal all the fixed charges of the company. If it does not do this it is really not a service charge that is being made, and the consumers are really justified in calling it a meter rental or any other thing that they may decide to call it. One might almost go so far as to say that the charge is not absolutely honest. It is likely to deceive the gas manager as well as the consumer.

If the charge is not right and the gas consumption falls off, the company may be just as badly off as it would have been had there never been a service charge made. If the service charge is a real service charge; if the total amount collected for service charges in a year equals the actual fixed charges, the overhead of the company, then, no matter how much the consumption may fall off, it is still going to be possible to meet all expenses.

This is the real function of the service charge: to protect the investment of the company, to guarantee a return which will make it possible for that company to sell its service at the very lowest rates. If the service charge is right there is little need of step-rates. A service charge and a low consumption charge or rate are all that are needed. The fact that a step-rate is used in addition to the service charge is the best indication that the service charge is not high enough.

Before the idea of the service charge can successfully be sold to the public it will be necessary for all, or at least a majority, of the gasmen to understand this function of the service charge and to apply the charge in a scientific manner. When the gasman understands the charge himself; when he arrives at the charge in an accurate and scientific manner, he is not going to find

it nearly as hard to sell the idea to public service commissions and to the public as he is finding it to sell the so-called service charges which are not, and which everyone knows are not, real service charges but merely a scheme to increase the revenue.

Selling the Idea

A real service charge means that the large user is going to get his gas at a considerably lower net rate than he is getting it to-day, and this means that it is not going to be a difficult job to sell him the idea of the service charge. It is merely a matter of proving to him that the charge is really to his advantage. This was exactly what the electric light companies did In the course of a year or so very few if any of these large users would want to go back to the old system, and this in turn means that all these people—who, by the way, are likely to be the most influential people in town—are going to stand by the charge and explain its virtues to other people.

It will be true that a great many people who use gas in their homes and who are now paying such small monthly bills that they are a loss the company will have to pay a higher net rate if they do not increase their consumption. It will also be true that the consumption rate will be so much lower than it is to-day that there will be an incentive to use more gas in order to reduce the net rate. When using the gas range, the water heater, the room heater or a few additional lights means that the monthly bill will be only a little larger but the net rate of gas will be lower, these additional uses of gas will be made. Electric light companies have already found that it works out that way. Many a woman is doing her ironing with an electric iron who would hesitate about doing it if it were not for the fact that the dollar, dollar-and-a-half or other service charge must be paid anyhow, while the rate for the current itself is only, say, 8 cents. It is going to cost less than 4 cents an hour to use that iron and she is saving money by using it. Therefore she uses it.

In the case of gas, with the high rate and the low service charge, it is an entirely different matter. Every cubic foot of gas used makes a marked difference in the amount of the bill without very materially reducing the net rate. So why not use electricity everywhere possible and effect a real economy? This is the way it is working out; and even though no fault is found with the electric service charge, the gas company is accused of being a robber.

If the readiness-to-serve charge per household consumer actually figures out to be $1.50 or $2 a month, it is only natural that many customers will object to the charge. If, on the other hand, the gas can be sold for 50 cents a thousand cubic feet if this charge is put into effect and proportionate charges are made for all other classes of customers, then the company really has something to say that is to the interest of the customers. Until the business become readjusted to the new charges there may be a great many complaints; but one thing is certain—that when people once learn the advantage of this system they will be far more likely to be for it rather than against it, especially as the gas rate can be steadily reduced as operating charges become lower. At all times the company can depend upon the backing of the larger consumers, because the new basis will work out so greatly to their advantage. Under such a system the service charge can be sold. It is, in fact, comparatively an easy matter to sell it.

When the service charge is not scientifically established, when it is merely a means of increasing revenue alone, and the people know, as they are bound to, then it is a different matter to try to sell it to the people. The whole trouble lies in the fact that the gas company is trying to explain to the people that it has done something that it really has not done.

Tempered Copper and the Gas Industry

Wherein the Reported Solution of This Problem Affects Us

By ISMAR GINSBERG, B.Sc., Chem. Eng.

It has been reported very recently that the age-old problem of making a hardened copper has been solved. We know that the ancients knew how to do this, but it has remained one of the lost arts up to the present time. Our purpose is not to dwell on the peculiarities of this fact, neither on academic interest that it may have, nor on the question whether or not it has really been done and how it has been done We are merely concerned with the effect that this discovery might have on the gas industry, granted that it is an accomplished industrial fact.

The interest that the gas industry has in hardened copper lies in two directions: First, there is the possibility of the new metal being used in the construction of plant apparatus, of the transportation equipment and the household and factory installations, and of the various appliances in which gas is used. It may be stated right at the outset that new metal is of no importance whatever along these lines. Even though it would not have to be painted at all, a holder made from sheets of hardened copper would be so expensive that the carrying charges would be far more than the expense of painting the regular holder every year. The metal is of no importance at all about the gas plant As far as the meters are concerned, their long life, as they are made now from tin plate, is very satisfactory and, even if their life were materially increased by being made from the hardened metal, the additional cost would counterbalance by far any advantages that might be gained in this way. As far as gas appliances are concerned, copper enters into their construction only in the heating coils in a water heater. But in this case it is not a hardened metal that is wanted, and if the metal were hard to start with, it would soon soften under the continual exposure to the hot gas flame. As far as can be seen, the hardened copper would not be any more resistant to corrosion than regular soft copper. The resistive powers of combustion obtained by the burning of gas is after all the only thing that counts in the gas heater. Consequently, the hardened form, which, to

(*Continued on page* 284.)

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As the Journal Views It

Adding to Our Service

In announcing the appointment of Charles S. Meyers to the staff of the AMERICAN GAS JOURNAL it is felt that there is being given an added evidence of this magazine's strong faith in the future of the industry. The JOURNAL is sure that the members of the industry will appreciate that it is the aim of this paper, not only to preach progressiveness for the other fellow but to practise it as well.

Mr. Meyers has had a long experience in the gas industry. During the many years that he has been connected with the field he has done much to create a united industry and that he has succeeded is shown by the great number of leaders of the field that he counts as his friends. Mr. Meyers will make his headquarters at the main office of the JOURNAL in New York City, and will continue to be as active as he has in the past.

The appointment of Mr. Meyers coming so quickly after the opening of our Chicago office we believe will speak for itself as an example of progressiveness and will commend itself to those who believe that this is the time for a strong effort to be made to return to normal conditions.

The Convention Papers

This is the second issue in which advance reports of the papers to be presented at the annual convention of the American Gas Association have appeared. The AMERICAN GAS JOURNAL believes that it is rendering a real service to the industry by publishing these papers at this time, because it allows ample time for a thorough reading and it should add to the discussion that naturally will follow the presentation of these papers at the convention. There is another reason why this

is a particularly good time to print these articles, and that is because it will show that the coming convention will take up many of the perplexing problems that we have been confronted with.

But it must not be believed that all of the papers or all of the interesting material that will be developed at the convention will be presented in these columns in advance of the meeting. Such a task would prove impossible and would not serve any good end. There are bound to be many matters crop up during the sessions that will add to the value of the exchange of ideas, and that is one of the great reasons for the holding of such a meeting. When gasmen can get together and discuss their problems with those who understand them, and who, probably, can offer constructive suggestions, then a real advance will have been made.

It is to be hoped that the papers that are presented in these columns will be thoroughly read and digested, and that there will be a great deal of discussion regarding the various subjects. Numerous readers of the JOURNAL have already expressed their delight in finding these papers published in advance, and have congratulated both the American Gas Association and the AMERICAN GAS JOURNAL on having gotten together in this manner.

There can be no greater service rendered to the industry, according to one of our correspondents, than furnishing this advance information regarding the convention, and the fact that it is the policy of the AMERICAN GAS JOURNAL to print the papers as fully as possible adds greatly to their value.

But withal, the greatest benefit that can possibly accrue to a man in the industry is the actual attendance at the convention. Once again the AMERICAN GAS JOURNAL desires to urge with all possible earnestness that every man who possibly can attend the meeting. It will be well worth while.

The Present Availibility of Oil Shale

(*Continued from page* 272.)

unanimous opinion that the shale yielded its oil readily and that this oil was of high quality.

The most complete examination was made by E. Lawson Lomax, whose work will be unchallenged anywhere. These tests gave an average oil content as follows:

Sixty three and seven-tenths American gallons oil to the long ton (2,240 lb.), with 40 lb. recoverable sulphate of ammonia. On fractionating the oil, the following results were obtained:

Gasoline	16.5 per cent
Light kerosene	10.0 per cent
Heavy kerosene	9.0 per cent
Gas oil	14.0 per cent
Paraffin wax	2.2 per cent
Lubricating oil stock	27.2 per cent
Distilling and refining losses	21.1 per cent
	100 per cent

These percentages are equal to fifty gallons of refined products recoverable from one ton of our paper shale.

We believe this analysis may be safely taken as a standard of our high-grade Colorado shales, and there are plenty of them only waiting the plants to win their oil and by-product contents.

An analysis of the other extreme is interesting. This distil was obtained by running the small Brown retort at a very high heat. Large volumes of gas were made, of which unfortunately no check was kept, as part of it had to be by-passed to spare condensers. An analysis of the condensed liquor made by C. L. Constant resulted as follows:

Baume at 60 deg. Fahr.	14.2	
S.p. at 60 deg. Fahr.	1.1082	
Gasoline	2.11	per cent
Kerosene	22.15	per cent
Gas oil	8.05	
Lubricating oil	16.37	
Wax (approximately)	1.21	
Coke	44.52	

So that even under excessive heat, some interesting values were shown, although the liquor saved was practically the same gravity as Permuco crude.

With an apparatus of the type described the oil obtained will be entirely a matter of expediency. The shale residue has now been proved to be valuable for many purposes, and as the demand may be for more or less of the fixed and volatile carbons to be left in this residue, the oil recovery must vary.

In other words, you cannot have all your results at the same time, but this retort is so flexible that it will deliver its residue fully calcined, if desired, or with a wide range of hydro-carbon values still in it.

In May 10, 1920, Sir John Cadman, head of the British Petroleum Bureau, delivered an address before the Royal Institute in London and made this statement: That during the war there were 45,527 tons of cannel coal treated in England by low-temperature distillation under Government supervision, which yielded 5,585 tons of high-grade oils. Assuming seven barrels of oil to the ton, these coals yielded slightly over thirty-six gallons of oil per ton.

Facts like these open up many possibilities, for the Kentucky cannels and for coals of like nature which are widely scattered through the United States. If their oil yield is less than the Colorado shales, their possibilities to the gasman are immense and, while the shale residue is now proved useful in various ways, the coal residue always makes an ideal smokeless fuel and, best of all, in the case of Kentucky, the markets are waiting at its door.

Both fields only await the proper retort to bring out their hidden usefulness, and incidentally the greatest returns to the men who exploit them.

It would seem as if a retort had arrived. If so, shale has arrived, and is not a dream for the next generation.

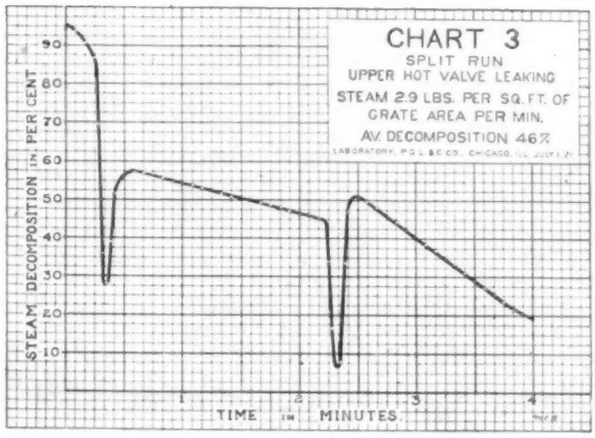


CHART 3
SPLIT RUN
UPPER HOT VALVE LEAKING
STEAM 2.9 LBS. PER SQ. FT. OF GRATE AREA PER MIN.
AV. DECOMPOSITION 46%
STEAM DECOMPOSITION IN PER CENT
TIME IN MINUTES

What Goes On in a Water-Gas Machine

(*Continued from page 278.*)

for the wet-bulb, and a regular small-bulb chemical thermometer for the dry-bulb. The special thermometer was calibrated to read directly in per cent decomposition. In working with the apparatus, continuity of operation was secured with very little attention; in fact, this attention was limited to supplying water for evaporation from the wet-bulb and occasional cleaning of the breeze screens. Continued accuracy of the indications was assured by readily detected signs of incorrect conditions. For example, failure to register the proper reading on the blast will indicate either that the wicking is not wet, or that the plugging of the screens has reduced the gas flow below that required; while the dry-bulb thermometer will show conclusively whether calibration temperature is being maintained.

The curves here presented show the percentage decomposition indicated by the instrument throughout various runs, on an eleven-foot U. G. I. set equipped with a Republic flowmeter for steam measurement. The hot valve on the machine is of the Levy type, in which upper and lower valve seats are in one body, being closed alternately by the same disc hydraulically operated. The individual readings are represented by circles which appear at five second intervals or oftener. Where the steam rate was practically constant, as was the case in most of the runs, the area under the curve represents the gas made, while that above the curve shows undecomposed steam passing through the set into the wash box.

Chart 1 is typical of an up run. It is interesting to note that at the very start of the run the decomposition is very near 100 per cent. This high rate of steam decomposition takes heat out of the fuel bed very rapidly, and the slope of the curve is steep. Toward the end, on the contrary, the decomposition is low, and it falls off slowly, as the fuel-bed temperature is not falling rapidly. In this connection, it may be recalled that to decompose one pound of steam takes almost seven times as much heat out of the fuel bed as to superheat a pound of undecomposed steam to checker-work temperature.

A split or up-down-up run is shown on Chart 2. The hot valve on the machine from which this set of data was taken was mechanically linked with the steam-reversing valve. It was so set that during part of the hot-valve change, steam by-passed the hot valve, with the result that apparently very low decomposition occurred at this point. Throughout this set of curves the deep hollows show the points at which the hot valve was changed. It will also be noted that approximately the same decomposition was obtained with the given fuel-bed condition, regardless of the direction in which the steam was passing through the fuel bed.

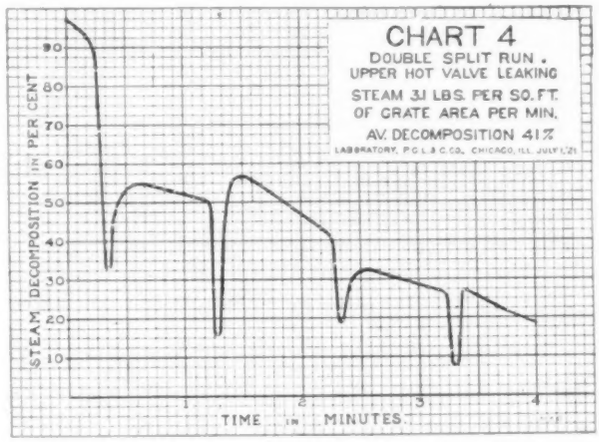


CHART 4
DOUBLE SPLIT RUN.
UPPER HOT VALVE LEAKING
STEAM 3.1 LBS. PER SQ. FT. OF GRATE AREA PER MIN.
AV. DECOMPOSITION 41%
STEAM DECOMPOSITION IN PER CENT
TIME IN MINUTES

The split or up-down-up run plotted on Chart 3 was taken from a machine whose upper hot valve was leaking. Charts 4 and 5 were also taken from the same machine. The apparent decomposition for the down-steam portion of this curve is much lower than a prolongation of the up-steam portion would suggest. Moreover, the slope of the down-steam portion of the curve is more gentle than in chart two, indicating that heat is being taken out of the fuel bed at a lower rate.

Chart 4 shows two reversals of steam on a machine whose upper hot-valve was leaking. In this curve the effect noted in chart three is persistent. It might be due to a leak in the hot valve or in the steam-reversing valve; either leak would dilute the gas with steam ahead of the point of sampling, and thus lower the apparent decomposition. Closing a tight gate valve in the up-steam line, beyond the reversing valve, had no effect on the readings of the water-gas indicator; but inducing a greater leak in the hot valve magnified the effect noted.

Chart 5 shows a split or up-down-up run in which

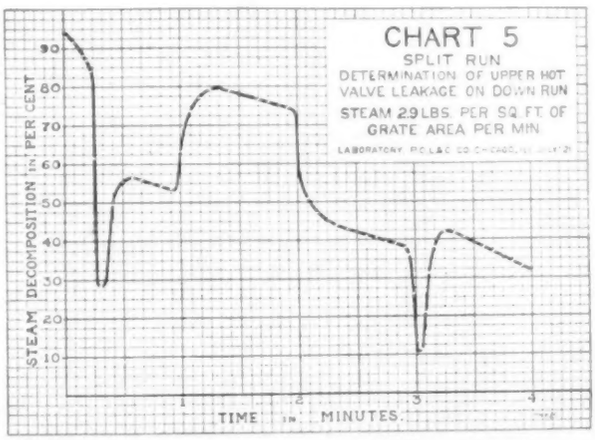
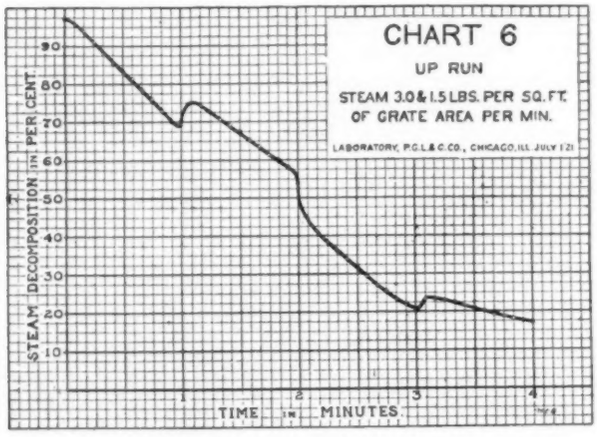


CHART 5
SPLIT RUN
DETERMINATION OF UPPER HOT VALVE LEAKAGE ON DOWN RUN
STEAM 2.9 LBS. PER SQ. FT. OF GRATE AREA PER MIN.
STEAM DECOMPOSITION IN PER CENT
TIME IN MINUTES

the sample for the indicator was taken, over a part of the down-steam portion, from ahead of the lower hot valve. In the sketch the sample line intended for this purpose is controlled by cock (B). Had the same decomposition been indicated for the samples taken ahead of and beyond the lower hot valve, no steam leakage by the upper hot valve might be safely inferred. However, as the hump in the curve shows, the indicator readings from ahead of the lower hot valve are much higher than those from beyond. From the relative decompositions shown it is possible to say confidently that on the down run 37 per cent of the total steam introduced into the machine did not go through the fuel bed but went directly across the upper hot valve, into the carbureter.

It should be noted that in spite of the steam leak the indicator registers the production and the per cent excess steam correctly, since the steam meter



measures the total steam input, not merely what goes through the fuel bed.

The effect of cutting the steam on a straight up run is shown by Chart 6. The steam rate was reduced 50 per cent after one minute, restored to its original figure after two minutes, and again reduced 50 per cent after three minutes. Since the decomposition increased about 15 per cent when the steam rate was cut in half, a large loss in rate of gas production resulted. The diagram shows that, at least for this coke, even a heavy cut in steam rate will decrease excess steam relatively little, while it decreased the production heavily; or in other words that, for the given condition as regards time of contact, intimacy, etc., the water gas reaction was well advanced toward equilibrium for the prevailing temperature, which latter thus became the dominating factor.

Tempered Copper and the Gas Industry

(*Continued from page* 280.)

be sure, is more expensive as well, would be of no advantage whatsoever in the manufacture of gas water heaters. So, as far as can be seen at the present time, hardened copper is of no interest to the gas industry along these lines.

On the other hand, when we consider the manufacture of this product, then we have another state of affairs altogether. If the reports concerning hardened copper are true, it is unquestionable that it will lead to great developments, as there are innumerable articles and tools and parts of machines which could be made out of copper and constitute a great improvement over their construction at the present time, if the copper were hard and tough. The process by which the new metal is obtained is of a thermal nature; that is, it involves the use of heat. There is no reason why gas cannot be used for this purpose to very great advantage. It rests only in the construction of the furnace wherein the heat treatment takes place.

The moment is early and the iron is red hot. Now is the time for the gasmen to strike. There is no use in waiting until this rumor is confirmed by the actual appearance of the new metal on the market, for then it may be too late. It may be that the whole thing is a hoax, but we believe that where there is a lot of smoke there is always a little fire. It will be well to find out what there is in the matter and run it to earth, so that we may not be sorry afterwards of "passing up a good bet."

Mammoth Holder Goes Into Service

(*Continued from page* 274.)

water. So for the next few weeks the expert mechanicians of the construction company will be paddling around in the rowboat and two punts in 15,000,000 cu. ft. of midnight blackness. It would take a very big light, one much larger than those they will carry, to make much impression on the absolutely air and water and light proof density of that blackness.

When every adjustment has been made the boats will be tied up under the manholes, the workmen will depart, the manhole covers will be bolted down, the air will be let out of the holder and gas pumped in. Then for years the rowboat and punts will have only themselves for company, for the holders are built to work on and on without any attention interiorily for long periods.

The placing in operation of this holder by the Astoria Light, Heat & Power Company marks the completion of an addition to the Astoria plant costing $7,500,000, and capable of producing 30,000,000 cu ft. of gas a day, in addition to the 50,000,000 cu. ft. produced by the original plant. This second unit to be erected at Astoria is a part of a contemplated plant to consist of six such units. Even as the plant stands to-day it is the largest gas-producing works in the world.

Oil Struck in Colorado

While the report is not definitely confirmed, the Midwest people playing the part of silence—does that not give assent—word comes that oil has been struck at Cortez, Col., down in the Southwestern part of the State, near the new Mexico line.

It is said that many interested people have gone to the field and that the Midwest drill in the well is making slow progress through exceedingly hard substance, which the drillers believe to be caprock, and also that much oil and gas fumes are coming from the hole.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	Sept. 22, 1921 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	91	91½
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	82	85
Columbia Gas & Elec. Co.	First 5s	Jan. 1, 1927	84	85½
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	99¼	100¼
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	77	77¼
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	101¼	101½
Consol. Gas Co. of New York	One Year Sec. 8s	Dec. 1, 1921	100⅛	100⅜
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	70	72
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	79	81
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	91	93
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	96	99
Hudson County Gas Co.	First 5s	Nov. 1, 1949	74	76
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1943	76½	78
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	96½	98
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	70	72
Milwaukee Gas Light Co.	First 4s	May 1, 1927	81	82½
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	83	83½
Pacific Gas & Elec. Co.	Col. Tr. Conv. 7s	May 1, 1925	98	99½
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	100¼	101
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	86	88
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	76	77
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	79	81
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	79	80
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	67	70
Southern California Gas Co.	First 6s	Nov. 1, 1950	84	87
United Gas Improvement Co.	Two Year 8s	Feb. 1, 1923	99⅜	99⅞
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	82	85
Washington Gas Light Co.	General 5s	Nov. 1, 1960	80	82
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	78	81

Capitalization Is Limited to $3,000,000 by Committee

Buffalo, N. Y.—While the gas interests here profess to be disappointed with the decision of the Public Service Commission handed down yesterday limiting to $3,000,000 the capitalization of the Niagara Gas Corporation, which is to take over the W. J. Judge artificial gas plant, it is likely that it will be accepted under protest. This amount is about what W. J. Judge paid for the plant. It was contended by Daniel J. Kenefick, attorney for Judge and the Iroquois Natural Gas Company, that a capitalization of $4,000,000 should be allowed in consideration of improvements made since Judge acquired the plant, and in compensation for the years during which the gas works were operated without profit.

"Of course, we don't like the decision," said Mr. Kenefick last evening in commenting on the action of the commission. "I have notified Mr. Judge about it and should get a reply the early part of next week."

The transfer of the plant and the holdings of Mr. Judge to the Niagara Gas Corporation is a step in the direction of a consolidation of the artificial and natural gas services here. The Niagara Gas Corporation was organized recently and its officers are associated with Judge Kenefick's law firm.

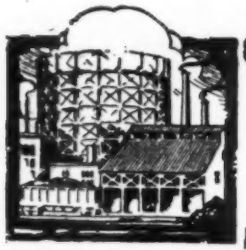
Mr. Kenefick said that about $400,000 will have to be spent in improving the artificial gas system and the supply for next winter. Mains will be extended, the water gas plant improved and a purifying station built near the plant of the Donner Steel Company from whose coke ovens Mr. Judge is now receiving about 1,000,000 cu. ft. of gas a day.

Plans have practically been finished for an artificial gas plant which will cost about $4,000,000 or more, and, it is said, will be submitted to the commission soon. Both gas companies are controlled by the same financial interests and it is their aim to consolidate the two services, furnishing a mixed gas which will be cheaper than the manufactured gas and higher than the natural gas rate. Gas company officials say that if the services are consolidated a constant supply will be assured to the consumers of Buffalo.

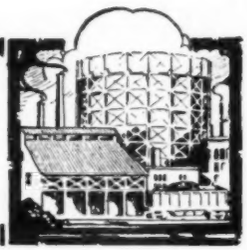
To Issue Stock

Indianapolis, Ind. — The public service commission has authorized the Citizens Gas Company to issue $1,000,000 of 7 per cent preferred stock. The commission directed that the stock is to be sold at not less than 95 per cent of its par value. Funds obtained from the stock sale are to be used in refunding bonds and to reimburse the company for money expended in making improvements in recent years.

The stock is to be sold in Indianapolis by a public campaign beginning Oct. 1, according to statements of company officials at the hearing on the petition to issue the securities. The sales force is to consist largely of employees of the company, a maximum commission of 3 per cent being allowed.



NEWS OF THE GAS INDUSTRY



Service Charge Upheld

Albany, N. Y.—The appellate division, third department, by a five-to-two decision, upheld the right of the Public Service Commission to grant gas companies the right to make a service charge.

The decision came in the case of the city of Rochester against the commission, and was regarded as a test case.

The commission last spring granted the Rochester Gas Company the right to make a service charge, and this was opposed by the city. The decision is regarded as of State-wide importance, because the commission has granted many similar requests to gas companies.

It is expected the case will be carried to the Court of Appeals.

Brooklyn Gas Rate Cut Ten Cents

Brooklyn, N. Y.—Lower rate per thousand cubis feet for gas made and delivered by the Brooklyn Borough Gas Company has been ordered by the public service commission.

Following hearings before Chairman William A. Prendergast, the commission ordered the company to make a rate of $1.35 immediately effective pending further investigation by the commission.

Hearings in the Brooklyn company's appeal for legalization of charges in excess of those fixed by statute will be resumed at a later date, it was announced.

This is the second reduction of the price in Brooklyn within the month. The company has been charging $1.55 prior to Sept. 1.

On that day the commission ordered a reduction of 10 cents, and it now orders a further reduction of 10 cents.

Examination of the company's contracts for gas oil is said to have shown a marked drop from wartime prices, and the reductions ordered are understood to be predicated largely upon that fact. When the first reduction was ordered the company was cited to appear on Sept. 7 and show cause why reduction to $1.35 should not be made.

The company asked a week's adjournment, which was granted. On Sept. 14 officials of the company appeared before the commission and agreed, it was stated, to the $1.35 rate pending further investigation.

Many Companies Making New Installations

The Citizens Gas Company, of Staunton, Va., is installing a five foot six inch water gas set complete, and an exhauster, both supplied by the Equipment Exchange, of New York City. The gas company's earnings have been greatly increased under the able management of George Riddelberger.

The Houston (Texas) Gas & Fuel Company has awarded a contract to the U. G. I. Contracting Company, of Philadelphia, for the installation of an eleven-foot cone top carbureted water gas apparatus, completely equipped with U. G. I. automatic control, also for a U. G. I. waste heat boiler.

With the new apparatus the manufacturing capacity of this plant will be increased by 3,500,000 cu. ft. per day.

The waste heat boiler will be connected to the new water gas set and will produce the steam necessary for the set, as well as relieve the load of the regular works boiler plant.

New Issue of Standard Bonds

The Standard Gas & Electric Company has sold to a syndicate of investment bankers, composed of H. M. Byllesby & Co., the Federal Securities Corporation and Hambleton & Co., an issue of $3,500,000 20-year 7½ per cent secured sinking fund gold bonds. Public offering was first made Sept. 7 and the advance demanded indicated that the issue would be redaily sold.

Last Call for M. G. A. Meeting

If there have been any lingering doubts in your mind as to whether it will be worth while for you to take advantage of the one occasion in the year to meet your fellow gasman of Michigan the following business program should dispel them (Eastern Standard time used):

BUSINESS PROGRAM

Meetings in Small Banquet Hall, Ballroom Floor

THURSDAY, SEPT. 29

9.15 A. M.—Call to order; Report of Executive Committee; Report of Secretary and Treasurer.

9.30—Reports of Special Committees: On Standards of Service, F. W. Seymour, chairman; on Accounting, H. M. Eaton, chairman; on Public Utility Information, H. W. Douglas, chairman.

10.00—Address of President: J. W. Batten, Detroit.

10.30—Address by Chairman Sherman T. Handy, Michigan Public Utilities Commission.

11.00—"Coal," S. E. Wolff, Hodenpyl Hardy & Co., New York.

11.30—"Coke," J. A. Ballard, sales manager of the Semet-Solvay Company, Detroit.

RECESS

1.30 P. M.—"Gas Oil," Blaine Gavett, secretary of the American Public Utilities Company, Grand Rapids.

2.00—"Modern Calorific Standards," J. K. Pettengill, gas engineer of the Michigan Public Utilities Commission; Experience at Pontiac, B. G. Campbell; at Battle Creek, F. W. Seymour; at Flint, R. H. Lawlor; at Lansing, Chester Grey; at Bay City, Samuel Ball; at Grand Rapids, J. T. Young.

2.45—"The Thomas Meter," W. J. Jefferson, New York.

3.00—"A New Station Meter," J. A. Brown, Jackson.

3.15—"Introduction of Blue Gas into Hydraulic Main," S. W. Cheney, Grand Rapids.
3.30—"Forced Draft and Orifice Measurement Primary and Secondary Air on Benches," R. H. Lawlor, Flint.
3.45—"Scrubber Standpipes," T. W. Weigele, Detroit.
3.55—"Scrubber Standpipes," E. J. Menery, Lansing.
4.05—"Thin Metal Standpipes," N. G. Caputi, Grand Rapids.
4.15—"Recording Calorimeter," W. J. Jefferson, New York.
4.30—"My Experience with Calorgraph," E. P. Davis, Holland.
4.45—General Discussion.

FRIDAY, SEPT. 30

9.30 A. M.—"Improving Regulation of Pressures on Hydraulic Main": at Battle Creek, F. W. Seymour; at Jackson; at Detroit.
10.00—"New Type Cement Joint for Large Pipe," F. J. Hall, Detroit.
10.15—"Handling of the Commercial Department in Times of Business Depression": E. C. Campbell, Benton Harbor; R. W. Reed, Lansing; J. F. Jones, Battle Creek; L. F. Ryall, Kalamazoo; Guy Halladay, Grand Rapids; C. W. Johnson, Jackson; F. S. Fugate; Detroit.
11.30—"Selling Securities Locally": O. P. Steele, Mount Clemens; Donald Mackie, Jackson.
12.00—Open Discussion.
12.30 P. M.—Report of Committees: On Resolutions; on President's Address; on Nominations.
1.00—Adjournment.

ENTERTAINMENT PROGRAM

On Thursday evening, at 6.30, there will be a dinner at the Hotel Statler.

Friday afternoon is left open for the individual preference of each member. Those who wish to play golf will be taken care of by applying to any member of the entertainment committee.

L. B. YOUNG, *Chairman;*
H. D. SCHALL,
F. S. FUGATE,
Entertainment Committee.

The Coal Supply

Bituminous coal output for the week ended August 13 was 7,726,000 tons, an increase of 551,000 tons over the preceding week and the largest total of any week since June 11.

Allowed Increase

Oklahoma City, Okla.—Heavy reduction in the sale of industrial gas, taken in connection with a falling off in the market for domestic gas forced the corporation commission to grant rate increases to the natural gas companies at Dewey and Guthrie within the past week, or permit these companies to conduct business at a loss with ultimate demoralization of service. The Guthrie Gas, Light, Fuel & Improvement Company not only showed that demands for industrial gas at Guthrie had fallen to about one-tenth of former sales but that the sales of domestic gas for the first seven months of this year were only 6.1 per cent of the sales for the first seven months of 1920. The commission issued an order increasing the domestic rate at Guthrie to 49 cents per thousand cubic feet. The Dewey rate was also fixed at 48 cents.

Light Plants Sold

Victoria, Tex.—Six light plants owned and operated by the Texas Gas & Electric Company have been sold in this city and were bid in by a man named Neilson, from Houston. The price bid was $700,000.

Neilson, it is said, bid for a big company operating electric light plants, and not for himself.

It is understood that Judge Hutchinson, the United States Federal judge, will have to approve the bid, and as he is said to now be in New York on legal business it is not probable consumers of the "juice" can hope for a reduction in rate before time to light the festal board for the Thanksgiving spread, or the Christmas tree.

Work Started on Gas Plant Addition

Rochester, N. Y.—The foundations for the addition to the coal-gas plant in the river gorge are about completed. The structure will rest on concrete piers that go down twenty-five feet to rock. In sinking the holes for the piers, the forms were built and placed section by section as the excavation was made and when rock was reached, all that remained was to pour the concrete and permit it to season.

The work of erecting the structural iron is under way. There will be a large amount of mason work, both brick and concrete, to do a little later. The structure will be fully fireproof with virtually nothing going into its construction but iron, steel, concrete and brick. While there is no time limit on completion of the contract, which is held by the United Gas Improvement Company, of Philadelphia it is expected the addition will be ready for service early in April, 1922. The cost is nearly $500,000

People May Vote on New Gas Rate

Middletown, Ohio.—The initiative measure submitted in behalf of the Ohio Fuel Supply Company and the Ohio Gas & Electric Company to increase the gas rate in Middletown probably will be voted on at the November election, states L. B. Marshal, general manager of the Ohio Gas & Electric Company

The initiative petition was circulated some weeks ago prior to the August primaries and it was hoped that it might be voted on by the people at that time. However the petition was filed too late and so it will go over to the November election.

The gas company was desirous of getting the matter before the people and so the unusual means of an initiative petition was employed. This is the first time that the "initiative" incorporated in the Middletown charter has been employed. This gives an opportunity for the public to express themselves at the polls relative to an increase in the gas rate at this time before the contract with the Ohio Fuel Supply Company expires. If the vote of the public is favorable to entering a new contract now, as it is claimed, guaranteeing a certain price for a new period of years; the city commission probably would adopt an ordinance authorizing a new contract.

Mexican Court Ruling

The Mexican Appellate Court has decided that article 27 of the new constitution is not retroactive and that Americans and others who made investments in Mexico oil lands previous to the adoption of the new constitution are safe However, in the future it is "Mexico for the Mexicans."

Let it go at that, then perhaps there will be a recognition by this country to the country across the Rio Grande and may friendly sentiment forevermore permeate both sides and let business be done by this principle.

Company Wins Temporary Victory

Chicago, Ill.—The Illinois Commerce Commission recently awarded a temporary victory to the Peoples Gas Light & Coke Company in a tilt between counsel for the company and Donald R. Richberg, special counsel for the city in gas litigation.

The commission, having cited the gas company to appear September 28 and show cause why gas rates should not be reduced from the present rate of $1.15 per thousand cubic feet. Attorney Richberg asked leave to permit the city to intervene. He then moved that the commission direct the gas company to produce its monthly statements of revenue and expenses, showing prices paid for materials and other data bearing on the actual cost of gas, and lay them before the commission September 21, a week before the date of the hearing.

George A. Cooke, former justice of the Supreme Court, who appeared as counsel for the gas company, said that Richberg's request was improper and it would be impossible to comply with it even should the commission so order. He said he feared that it would be physically impossible for the company to get ready to submit its case to the commission September 28, a week later than the time when Richberg wished to see the books.

Part of the information the company woudl submit, he said, would be ready by Sept. 28, but he did not think the commission would compel the company to try its case "piecemeal" but rather would allow it to try the case "as a whole."

"The company has been cited to appear and show why the gas rate should not be reduced," he said, "and the company courts the opportunity to come in and make that showing. The company is especially glad to show that the rate is not excessive, in view of the misstatements that have been circulated about the city."

Oklahoma Natural Gas Company has deferred the 50-cent quarterly dividend due Oct. 1. This was due to temporary conditions whereby earnings have been reduced owing to shutting down of many industrial plants in Oklahoma. The company also decided to segregate its oil and gasoline business from the gas operations.

Installing New Purifiers

The Atlanta Gas Company is adding two new purifier boxes to the equipment of the local plant that, when installed, will add about one-third to the present purifying capacity of the plant and will materially improve the service and the quality of the gas.

In the manufacturing of gas, steam which is passed over ovens of hot coke, and oil which is sprayed over hot brickwork, each vaporizing, form a gas suitable for cooking and lighting except that it is full of sulphur. The gas is then passed through the purifying boxes which, by means of an oxide, remove the sulphur and leave the gas ready for use. The Atlanta company has spent several thousand dollars the past few months to improve the service in Atlanta and the quality of its product, and plans the addition of other equipment in the near future.

A Peep in the Oil and Gas Business

Using the American Petroleum Institute's figures, the daily average gross crude-oil production in the United States for the week ended Aug. 27 was 1,303,070 barrels, as compared with 1,315,440 barrels for the preceding week, a decrease of 12,370 barrels.

With four less completions, the daily production in the Wyoming fields in August increased 1,500 barrels over July. The Salt Creek field headed the list with twelve completions and 7,700 barrels of new production.

Montana's oil production fell off 300 barrels in August as compared to July. Of two completions in the Cat Field, one was a dry hole, the other a 300-barrel daily production. The entire State showed seven completions and 600 barrels output. There are many drills at work, however.

One gas well in Natrona County and one in the Lost Soldier district added 14,000,000 cu. ft. of gas to Wyoming's daily yield.

Pacific Gas & Electric Company has declared the regular quarterly dividend of $1.25 on the common stock, payable Oct. 15 to stock of record Sept. 30.

Late Facts Concerning Peat and Lignite

The convention of the Society of Chemical Research, recently held in Montreal, discussed the feasibility of replacing coal with peat and lignite so that Ontario and Eastern Canada would be less dependent upon the United States for fuel. From various sources I learn that there are 20,000,000 acres of peat land in this country and the bulk of it is in Minnesota, while in Canada it is said there are 30,000,000 acres of peat.

Because of the fact that peat consists of 85 to 90 per cent moisture, it has not been in favor as a fuel, but late-day experiments have demonstrated that not only can the moisture be driven out of the peat at a small cost—about $2 a ton—but after that is done it makes a fine fuel, almost the equal of coal.

The depth of the peat beds which are decomposed vegetable matter, ranges from five to ninety feet.

With the Chemical Research Society behind the peat fields, and so much sanguineness shown, we have every reason to expect that peat for fuel will soon prove its worth.

Lignite, which has been a standing joke as a fuel for ages, will also go through a process so that when the moisture is extracted there will remain a substance that will be a fuel almost equal to coal, in every conceivable use and in addition, from the moisture extruded, there will be obtained drugs, cosmetics, photograph chemicals, etc.

There are several thousand billion tons of lignite in the United States, and Germany has large quantities.

So much for science; so much for our weal, for all which let us be duly grateful.

City Will Buy Plant

Ukiah, Cal.—By an order of the Railroad Commission the Ukiah Gas Company has been given permission to sell its gas plant to the city of Ukiah for $13,800.

The city of Ukiah in a recent election voted to purchase the property at a valuation to be fixed by the Railroad Commission.

Nibbling in Oil

Some idea of the depression of business may be gleaned from the report, covering the first six months of 1921, coming from the Atlantic Refining Company, one of the Standard's largest children. The net loss after interest, depreciation, depletion and inventory adjustment is $8,114,201, compared to $3,782,500 in the corresponding period in 1920.

The Preston Oil Company has purchased a 12½ per cent interest in a gas well now being drilled by the Simplex Oil Company in section 32-12-14, Okmulgee County, Oklahoma. The well is now down about 500 ft. and the pay sand is expected at 1,750 ft.

What is said to be of special significance in drilling operations happened in the southwestern part of the Osage (Wyo.) oil field. Oil was struck by the Wyoming Petroleum Company on section 1-45-64 at 2,150 ft., or 600 ft. deeper than any other wells in that field.

Geologists prouounce it the third terrace.

Flowing 4,000 bbl. in the first twenty-four hours and said to be a 2,000-bbl. gusher is the latest completion by the Ohio company on the northwest quarter of section 12-39-79, Salt Creek (Wyo.) field.

In the same field, on section 13-40-79, six miles north of the Ohio gusher, a holding of the Mountain & Gulf brought in a 5,000-bbl. well.

Report sfrom the Montezuma Valley of southwestern Colorado are that dreams have come true and oil has been struck in commercial quantities in McElmo Canon. The Montezuma district is large in area and great results are expected.

According to a statement of valuations fixed by the Wyoming State Board of Equalization, the production of crude oil in Natrona County, Wyo., which includes the Salt Creek field, amounted to over 9,500,000 bbl in 1920, with an assessed valuation of $19,304,391.02.

The average value of the oil was placed at $2 a barrel, the ruling price during the year.

Here follows a list of some of the producers and their product:

	Barrels
Midwest Refining Co.....	3,650,706
Midwest Oil Company....	3,380,507
Wyoming Oil Fields Co...	919,165
E. T. Williams Oil Co.N	297,233
Northwestern Oil Co.....	279,747
Ohio Oil Company.....	270,657
Salt Creek Consolidated..	231,058
Sinclair-Wyoming	158,164
Kasoming	66,491
Domino-Bessemer	62,454
Duthie	49,281
Wyokans	26,092
Glenrock	21,664
Mosher	17,730

The foregoing list does not show all that were fortunate in bringing forth oil from this wonderful section, but it shows the more fortunate.

Reports current September 15 are that H. B. Gates, president of the Gas Oil Company, has resigned and that E. L. Prentiss, a director of the Gates company, was elected president. Further gossip is that Mr. Gates sold 500,000 shares of the Gates Oil Company stock to parties interested in the Elk Basin Consolidated Petroleum Company and that it looks like the Elk will take control of the Gates.

Mr. Prentiss, the new president, said that it is too early to make any predictions as to the Elk taking over their company, but if it should so happen he will announce it.

Mr. Gates admits that he is out of the oil business for the present.

Charles R. Vanneman to Be Chief Engineer

The State Public Service Commission to-day announced the appointment of Charles R. Vanneman as chief engineer of the commission, at a salary of $8,000 a year. Mr. Vanneman was formerly with the old Public Service Commission of the second district from 1910 up to the time of the creation of the present commission. He was originally appointed by the old commission as inspector in the division of transportation. Subsequently in 1914 he became chief of division of Steam Railroads, and in 1918 his duties were extended to include those of the engineer of grade crossings. Later, as chief of division of railroads, he had charge of steam railroads, electric railroads and grade crossing eliminations in the State, outside of Greater New York.

His new position as chief engineer places him in charge of engineering and inspection work for the commission of all steam railroads, street railroads, grade crossings, electric light companies, gas companies, telephone and telegraph companies throughout the State.

Previous to his appointment on the old commission, Mr. Vanneman was acting chief engineer of the State Civil Service Commission and assistant engineer for the State engineer and surveyor. Prior to that he had been for some time in the employ of the Pennsylvania Railroad. He is a graduate of Cornell University and resides in Albany.

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21 Cities Represented at Gas Hearing

Fort Worth, Texas.—Twenty-one cities and towns and two gas companies will be represented at the hearing in the Fourteenth District Court on the motion of the Lone Star Gas Company that the bond of the North Texas Gas Company be increased from $10,000 to $300,000 pending the settlement of litigation between the two companies. The representatives of the cities will be aligned with the North Texas Company in opposing the motion.

This will be the first court hearing in connection with the controversy that arose between the gas companies when the Lone Star Company, producers, notified the distributing company that contracts between the two companies were to be cancelled, and the later notice that a new price of 38½ cents per thousand feet of gas would be put into effect.

The distributing company obtained a restraining order to prevent the shutting off of gas by the Lone Star Company, and the hearing on the application for a permanent injunction will be held during the October term of the Fourteenth District Court.

The cities supplied by the two companies entered the fight to prevent the shutting off of gas. When the producing company filed a motion that the bond of the North Texas Company be increased by the court from $10,000 to $300,000 the representatives of the cities voted to oppose the motion.

The Lone Star Company alleges that the North Texas Company owes it in excess of $200,000 and that it is making no payments on account, the settlement of the controversy.

The North Texas Company, however, maintains that there is no reason for such a large bond, that the company is solvent and that it would work a hardship to pay the premiums on such a bond.

G. & E. Companies Again Seek Revision of Laws

Boston, Mass.—Gas and electric interests of the State recently appeared before the public utilities commission and renewed their arguments for a revision of present statutes which are held to work hardship upon the companies and injustice as well to the public, the main plea being for the granting of authority to capitalize the premiums of lighting corporations, a proposition that was rejected by the last legislature.

What the legislature finally succeeded in doing was to pass a resolution providing for an inquiry by the public utilities department into the capitalization of gas and electric companies and to consider whether any changes in the existing systems are necessary or expedient, and, if so, to report recommendations to the legislature of 1922.

E. W. Burdett, counsel for the Massachusetts Gas and Electric Light Association, composed of 26 electric companies, 15 gas companies and 12 gas and electric companies, 53 in all, was put through a severe grilling by Chairman Henry C. Attwill and Commissioner Everett E. Stone.

After explaining that the premium is the difference between the par value of the stock and the price for which the stock was actually sold, Mr. Burdett said the corporations ought to be allowed to issue $30,000,000 worth of stock, the amount of the premiums, and distribute it among the stockholders, to remedy the unfairness.

Asked what rate of dividend would have to be offered investors who would purchase new stock at $100 par value, Mr. Burdett said that 8 per cent would be necessary under present conditions.

The law requiring new stock issued by public utilities to be offered at a premium is peculiar to Massachusetts and has no justification, Mr. Burdett declared. "A great deal of the hostility and prejudice against gas and electric companies on the part of the public is due to the fact that they observe some of these companies apparently paying 20 per cent dividends on their par value," he said.

"The public does not realize that the real rate of dividend may be only 4, 5 or 6 per cent on the amount invested in the property. This feeling on the part of the public should be removed, and would be if the par value requirement were removed."

Prefers Old Gas with Old Price

Passaic, N. J.—Gas of 525 B.t.u. is more economical and quite as efficient as gas of 600 B.t.u., according to the preponderance of testimony before the Board of Public Utility Commissioners at the hearin gof the application by the cities of Newark and Jersey City, among others, for an increase in the present 525 B.t.u. standard.

If the Public Utility Board assents to this view, it will be able to order the Public Service Gas Company to decrease its present rate of $1.40 a thousand cubic feet, to a lower point than if it were, at the same time, to order an increase in standard. The hearing as to the standard was instituted by the cities, and not by the board, as was the hearing on the rate. The rate hearing affects only the Public Service, while the standard hearing affects all the gas companies in the State which banded together in the New Jersey Gas Association, were represented by William M. Wherry.

Some Fishermen

M. W. Walsh, superintendent of the gas department of the Louisville Gas & Electric Company landed a twenty-two-pound muskellunge while he was a guest recently at the summer home of Dennis T. Flynn, at Dennis Island, Georgian Bay. Mr. Flynn, former congressman from Oklahoma and pioneer of that State, has been fishing in the waters around Dennis Island for ten years with nothing like the success crowning Mr. Walsh's initial efforts. The weight of the fish, according to Mr. Walsh, was attested to by Mr. Flynn and others. On his way home to Louisville Mr. Walsh distinguished himself in a railroad wreck by rendering first aid treatment to members of the crew who were severely injured.

Service Charge Allowed N. Y. Gas Companies

Albany, N. Y.—The following companies have been allowed the levying of a service charge by the New York Public Service Commission during the past year:

Albany Southern Railroad Company, 75 cents a month; Bath Electric & Gas Light Company, 50 cents; Chuctanunda Gas Light Corporation, 50 cents; Cohoes Power & Light Corporation, $1; Fulton County Gas & Electric Company, 50 cents; Fulton Fuel & Light Company, 35 cents; Gas Light Company of Waverly, 25 cents; Granville Electric & Gas Company, 75 cents; Halfmoon Light, Heat & Power Company, 50 cents; Kingston Gas & Electric Company, 50 cents; Mountain Gas Company, Inc., $1; Nassau & Suffolk Light Company, $1; Patchogue Gas Company, $1; People's Gas & Electric Company of Oswego, 50 cents; Public Service Corporation of Long Island, $1; Rochester Gas & Electric Corporation, 85 cents; Rochester Gas & Electric Corporation, 40 cents; Rome Gas, Electric Light & Power Company, 40 cents; Sea Cliff & Glen Cove Gas Company, 75 cents; Utica Gas & Electric Company, 50 cents; Central New York Power Company, 75 cents; Northern Westchester Light Company, 60 cents; Owego Gas Light Company, 50 cents; Peekskill Light & Railroad Company, 50 cents; Peekskill Suburban Gas Company, 50 cents; Westchester Lighting Company, 60 cents.

Denver Pays Well for Gas and Electricity

Jason Pepper, writing in the *Rocky Mountain News*, says: "Frank Freeoff has been in Denver and says that the City Service Company is making more money than it knows what to do with, and also tells the people that the Denver Gas & Electric Company is the hub of the whole works. It is a good time for City Attorney Jim Marsh to say "Please remit."

For your information, the present writer will say that the so-called suit between the city of Denver and the gas company, which has been frequently mentioned in this journal, is still in statu quo, and it might just as well be a marble statue, as there is nothing doing on the surface.

Defers Dividend

Pittsburgh, Pa.—The Lone Star Gas Company, meeting in Fort Worth, Tex., deferred the quarterly dividend of 50 cents, due Sept. 30. The unanimous opinion of the board is that the dividend can be restored Dec. 31. The Oklahoma Natural Gas Company has deferred the 50-cent quarterly dividend which is due Oct. 1. This was due to temporary conditions whereby earnings have been reduced owing to shutting down of many industrial plants in Oklahoma. The company also decided to segregate its oil and gasoline business from the gas operations.

Gas Prices Cut in Norfolk

Norfolk, Neb.—The gas company has cut its rates from $2.25 per thousand feet to $2. This reduction was made commencing on Sept. 1, when the August bills became due. Gas company officials who made the reduction, with no other announcement except notification to the city council, state that their action followed previous promises that the rates would be cut at the earliest possible moment. The company raised the rates when it was forced to pay unusually high prices for oil. Mayor Friday, in discussing the reduction of gas rates, stated that he had requested the reduction some time ago and was told by gas company officials that it would be made as soon as possible.

"I have requested that the rate go down to $1.75 as soon as the company can cut it to that figure," the Mayor said.

The gas company has made a large number of additions during the year. Along with considerable improvements in the plant, many additional gas mains have been constructed. Many new consumers were added to the list as a result.

News from Oil Land

Announcement has been made that the Standard Oil Company of Indiana will assume the operation of the refineries of the Midwest Company at Casper, Greybull and Laramie, Wyo., the new arrangement to become effective October 1. It will also continue in prospecting and developing the oil resources of Wyoming and neighboring States.

The Midwest plant at Casper is one of the most elaborate and complete in the country, with facilities for handling 50,000 bbl. of crude oil daily.

It is stated that the change in operating policies was made possible when the Standard secured stock control of the premier company of the Rocky Mountain regions last year, and that the new method is also one of expedition and economy.

Investigate Gas Rate

San Francisco, Cal.—The Railroad Commission has announced that an investigation will be made of the artificial gas rates charged by four companies who have not yet conformed to the commission's program of lowering rates to correspond with declines in oil prices

The companies and the dates for hearings are:

Western States Gas & Electric Company, rates in Stockton, hearing in Stockton, September 6.

Coast Counties Gas & Electric Company, serving Santa Cruz, Watsonville, Hollister and other points in that vicinity, September 30 at Watsonville.

Cenetral Counties Gas Companies, serving Visalia, Lindsay, Tulare, Porterville and Strathmore, September 27 at Visalia.

Modesto Gas Company, serving Modesto, September 28, at Modesto.

The Western States Corporation has an application before the commission to reduce its rates 5 cents a thousand feet. It serves a mixed produce of artificial and natural gas.

Was "Sales Manager"

In our issue of September 10, we stated that W. S. Guitteau had resigned as general manager of the Stacey Manufacturing Company, of Cincinnati, Ohio. This should have read that Mr. Guitteau had been general sales manager of the Stacey Manufacturing Company for the past two years

Construction Notes

The Gas Machinery Company, Cleveland, Ohio, has been awarded contract for a new five-foot double superheater carbureted water gas apparatus by Webster City, Iowa.

This new set will be placed alongside of the old water-gas set in the existing building and will be complete with operating platform.

The installation of this new apparatus will put the plant in first-class condition to take care of their increasing load and continue the good service that has been delivered to the citizens of Webster City in the past.

Sells Gas Equipment

A P. & A. tar extractor recently purchased from the Equipment Exchange, New York City, forms part of the gas-cleaning equipment at Salem, N. J.

The Gastonia & Suburban Gas Company, of Gastonia N. C., is installing coal-gas apparatus, some of which was also obtained through the Equipment Exchange.

Automatic Controls Being Installed

Following the first installation of automatic controls, the Peoples Gas Light & Coke Company, of Chicago, have contracted with the U. G. I. Contracting Company, of Philadelphia, for the installation of nine additional U. G. I. automatic controls. These are now being installed.

Personal Notes

Ellwood Rowand, Jr., has joined the North Indiana Gas & Electric Company at Hammond, Ind.

R. W. Callaway, who has been serving as superintendent of the municipal gas, water and electric plant at Augusta, Kan., has resigned to return to his former position as superintendent of the Newkirk, Okla., plant, where he had formerly been employed for three years.

James I. Buchanan, vice-president of the Manufacturers Light & Heat Company, Pittsburgh, Pa., has been given a degree of doctor of laws by Allegheny College, Meadville, Pa., in honor of his service to the college and the district around it. Mr. Buchanan is also a director of the Natural Gas Company of West Virginia, director of the Pittsburgh Trust Company, president of the Terminal Trust Company, president of the Pittsburgh Warehouse & Transfer Company, president of the Washington Oil Company and president of the Taylortown Natural Gas Company.

C. Murphy Candler, of Atlanta, Ga., has been re-elected chairman of the Georgia State Railroad Commission by the unanimous vote of his colleagues. The re-election marks the beginning of his sixth consecutive term as chairman of the commission, the longest period any chairman has ever served. He has now held the chairmanship for almost ten years, exceeding the record of the late Col. L. N. Trammell, who held the office for nine years and eight months. Mr. Candler has been a member of the commission for twelve years.

Conserving Gas Is Not in the Power of Commission

Charleston, W. Va.—The public service commission "has nothing to do with the conservation of gas, and any arguments of the gas companies for an increase in rates upon that line are ridiculous," according to the brief prepared by W. Gordon Matthews for the manufacturers' division of the Charleston Chamber of Commerce, which has just been filed with the public service commission.

The "sole power" conferred upon the public service commission "by law" is to "fix rates, fair, reasonable and just to the public and also to the applicant," and the commission has no authority to endeavor to "conserve gas."

The brief declares that it is neither within the power nor proper policy of this commission to allow said company to charge an unreasonable, unfair and unjust rate, considering the service which it renders, because of the alleged reason that the supply of natural gas in this State will evidently be exhausted, and say that if such averment be true, which these remonstrants do not admit, it constitutes no ground or reason why the public should be required to pay unreasonable and exorbitant prices for gas prior to its exhaustion."

The remonstrants aver that the United Fuel Gas Company has ample gas in its territory almost immediately adjacent to the city of Charleston to supply such city and vicinity, and all of the other customers, present and prospective, of said United Fuel Gas Company for an indefinite number of years, in the future, and are advised that the alleged conditions prevailing elsewhere and in other States have no bearing upon the condition of said company in this State, and particularly in this section.

Directors Vote 20-Cent Rate Reduction

Lowell, Mass.—Following a meeting of nearly two hours' duration, the directors of the Lowell Gas Light Company voted to reduce the price of gas, beginning Nov. 1, from $1.60 to $1.40 per thousand cubic feet.

It was announced at the time of the reduction that the date of Nov. 1 was set because at that time existing contracts for coal expire. It was the inference that on Nov. 1 the contracts for coal and oil will be for lesser figures than now exist.

The formal statement given by Manager C. R. Prichard was as follows:

"In accordance with the usual custom of reducing prices as fast as conditions warrant, the Lowell Gas Light Company is pleased to announce to its customers that on Nov. 1, 1921, owing to decreases in the cost of coal, oil and labor, the price of gas will be reduced from $1.60 net per 1,000 cu. ft. to $1.50 ner per 1,000 cu. ft."

During the present year the price of gas has been reduced 10 cents per 1,000 cu. ft., or from $1.70 to $1.60. The forthcoming reduction to $1.50 will be the second one for 1921.

The matter of reducing the price has, it is understood, been under consideration for some time.

Contracts for Purifiers

The Gas Machinery Company, of Cleveland, Ohio, which furnished new purifier equipment at Galveston, Tex., several years ago, is under contract to furnish additional purifier equipment consisting of 20 ft. diameter by 12 ft. high duplex steel purifier complete with self-sealing cover and side doors, trays and tray beams, structure for carrying cover hoisting apparatus and piping, fittings and gate valves for standard valve arrangements.

The Gas Machinery Company also has purifier contract from the Mount Clemens (Mich.) Gas Light Company, covering materials for four purifiers, valves and fittings.

Will Discontinue Gas to Service Company

Hamilton, Ohio.—The city of Hamilton will discontinue selling gas to the Hamilton Service Company after September 26, forcing that company to shut off approximately 500 consumers, Service Director William F. Mason announced.

Consumers of the private company will be turned over to city lines. Work of connecting up with city lines has already been started.

Increases Capital Stock

Syracuse, N. Y.—The Syracuse Lighting Company, a subsidiary of the United Gas Improvement Company, has increased its authorized capital stock from $4,000,000 to $5,000,000, additional capital to consist of preferred stock. All the preferred stock of the company has been made cumulative, with interest rate fixed at 8 per cent.

Johnstown Gas Case Up for Hearing

Harrisburg, Pa.—A question of very considerable interest in natural gas circles, "Has a natural gas company the right to cut off its supply to a community?" will come before the public service commission when what is known as the "Johnstown gas case" comes up for hearing before the State regulatory body.

This was originally a rate case, in which the Cambria Steel Company and Louis Franke, then Mayor of Johnstown, opposed an increase by the Johnstown Fuel Supply Company from 15 to 18 cents per thousand feet, effective Aug. 15, 1916, on all gas served for industrial purposes. Gradually the issue broadened until the city of Johnstown and the Johnstown Fuel Supply Company joined forces to fight the People's Natural Gas Company, which was proved to have raised its rates to the fuel supply concern. The fight as now shaped up involves these three main issues:

1. Whether the People's Natural Gas Company, which supplies gas to the Johnstown Fuel Supply Company for sale to consumers, shall be permitted to cut off the Johnstown service as of Oct. 1.

2. What rate, if the gas service is ordered continued, shall be charged consumers.

3. Whether a "readiness-to-serve" charge of 50 cents per month per consumer, which the Johnstown Fuel Supply Company collects, can be considered "gas consumption revenue," and, if so, whether the 70 per cent of its receipts the Johnstown concern pays the People's Gas Company for its natural gas should not include also 70 per cent of the 50-cent service charge.

If the commission decides it cannot stop the People's Gas Company from shutting off service, the other questions at once fall automatically.

Will Not Accept New Lighting Rate

Lawrence, Mass.—At the meeting of the committee on accounts the city council refused to accept the increased rate upon street lighting set by the Lawrence Gas Company, and only approved the June street lighting bills, the old rate being in effect during May, while the new rate started June 1.

Lower Cost of Oil Makes Reduction Possible

Stockton, Cal.—Permission to reduce gas rates in Stockton 5 cents a thousand feet at once will be asked of the California State Railroad Commission by the Western States Gas & Electric Company, according to announcement of Samuel Kahn, vice-president and general manager. He states that this reduction is made possible because of recent decreases in the price of fuel oil, one barrel of which is used to produce 5,000 cu. ft. of gas.

The announcement of Mr. Kahn follows the action of the railroad commission about two weeks ago ordering on its own initiative reductions in gas rates charged by public utilities operating in the principal cities of northern California. The order of the railroad commission, however, did not include the cities served by the Western States Gas & Electric Company, it being the intention, it is understood, to take up the case of that utility shortly. In making application for permission to reduce rates the Western States has undoubtedly anticipated action by the utilities commission.

In speaking of the present situation as compared with other years, Mr. Kahn states:

"In 1915 we paid as low as 70 cents per barrel for oil, and in 1920, when oil reached its maximum price, we paid as high as $2.30 per barrel, an increase of $1.60 per barrel f. o. b. Stockton. Oil now costs us $1.70 per barrel f. o. b. Stockton, a saving of 60 cents per barrel under the maximum price.

"One barrel of oil produces 5,000 cu. ft. of artificial gas," Mr. Kahn continued, "therefore the saving of oil in cost per 1,000 ft. of artificial gas produced is 12 cents; but since only 60 per cent of the gas sent out to the mains for consumption is made from oil, the balance being natural gas, the actual saving is 60 per cent of 12 cents, or 7.2 cents per 1,000 ft. of gas made, or about 8¼ cents per 1,000 ft. of gas sold, the slight difference being due to gas lost and unaccounted for in the distribution system.

"As an offset to this saving in oil, taxes have increased approximately 2½ cents per 1,000 ft. of gas sold," Mr. Kahn says. This increase in taxes is caused by the King tax bill, which recently was enacted by the State legislature after one of the most memorable lobbies and campaigns for public support in the history of the State.

Although stating that he has no positive information concerning the oil situation, Mr. Kahn believes that the recent declines have resulted from decreased shipments by rail, causing an increase in the surplus which amounted to 7,000,000 barrels in six months.

In closing his statement Mr. Kahn says: "The net saving per 1,000 ft. of gas sold is in round numbers 5 cents, and this saving we will gladly give to our consumers."

Sliding Scale Is Recommended

Cincinnati, Ohio.—A sliding scale upward on the cost of gas is recommended by City Electrician Kleine, after exhaustive investigation into the supply fields.

Kleine bases his findings upon the fact that natural gas production is decreasing. He recommends in his report that consumers be classified and that educational campaigns looking toward economy in consumption be made. This report will be submitted to the Council Committee on Light, which will have charge of the fixing of a new rate for gas to become effective when the present arrangement expires on Nov. 4.

The recommendation is made that industrial use of gas be curtailed when domestic consumption is at its peak, and recites that even though the Union Gas & Electric Company has facilities for the manufacture of gas at the rate of 16,000,000 cu. ft. a day, this gas has not the calorific efficiency of the natural product.

An interesting feature of the findings of Mr. Kleine is the quotation of the report of State Geologist White of West Virginia that the natural gas fields will be exhausted within five years.

Cincinnati consumers are now paying 40 cents per thousand for gas, with 5 cents reduction for payment within a specified time. The report shows that Akron is paying 60 cents; Cleveland 35 cents for domestic use and 75 cents for industrial purposes, and with a new rate of from 50 cents to 60 cents minimum pending. Columbus now pays 30 cents, with a rate of from 45 cents to 65 cents to be acted upon, while Dayton pays from 50 cents to $1, and Hamilton 60 cents to 70 cents.

The report lays greatest stress upon the advisability of providing the sliding scale so as to favor domestic consumption and to aid in the conservation of the rapidly dwindling supply. In this connection is cited the report of the Cleveland Chamber of Commerce, which showed a saving of 31 per cent consumption after the adoption of the sliding scale.

Cullinan Explains Plan of New Gas Corporation

Houston, Tex.—No affiliation whatever exists between the Arkansas, Louisiana & Texas Development Company and the American Republics Corporation, according to a statement issued by J. S. Cullinan, one of the incorporators of the former concern. Mr. Cullinan's company proposes to develop the natural gas resources of northern Louisiana and southern Arkansas. The company will pump gas to Memphis and possibly Houston.

Mr. Cullinan't full statement follows:

"Answering numerous inquiries, beg to state that this company, recently chartered under the laws of Delaware by Messrs. E. A. Frost, of Shreveport, La.; John Walsh, of Washington, D. C., and myself, with a capital stock of $6,000,000, is in no way allied or connected with the American Republics Corporation or any of its subsidiaries, its stock being owned and controlled by my business associates and myself.

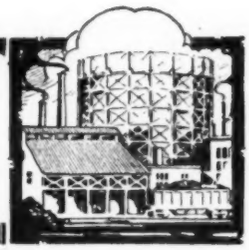
"The immediate purpose of this company is to construct pipe lines and other facilities for the transportatio nof natural gas from the gas fields of northern Louisiana and southern Arkansas to a point or points within or without the State of Arkansas and Liuisiana where natural gas can be marketed to advantage."

Asks Rate Increase

Corning, N. Y.—The Potter Gas Company, which distributes natural gas in Caton, South Corning and Southport, has filed with the Public Service Commission notice of its intent to increase the price of gas to 81 cents per thousand feet, with a discount of 5 cents per thousand feet for prompt payment. The existing rate is 68 cents per thousand.

The Addison (N. Y.) Gas & Power Company, which supplies natural gas to Addison consumers, gives notice it has applied to the public service commission for permission to increase its rate to 76 cents per 1,000 ft.

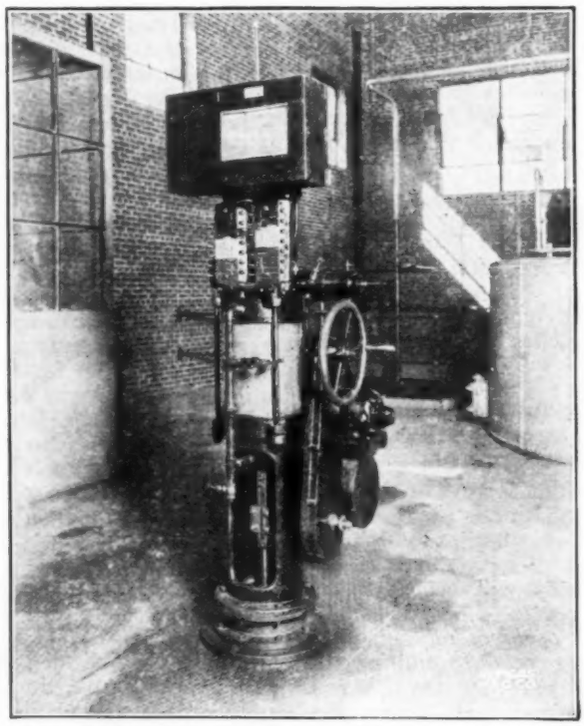
With The Equipment & Appliance Manufacturers



Conducted by Business Department of American Gas Journal

Western "Mechanical Man" to Operate Water-Gas Sets

The first actual test on the floor of a water-gas house has been given to the Western "Mechanical Man" to operate water-gas sets. The smoothness and accuracy with which it handles a water-gas machine are, no doubt, caused by its simplicity of design and the care that has been given to the working out of every point that would contribute to its success.



Western "Mechanical Man"

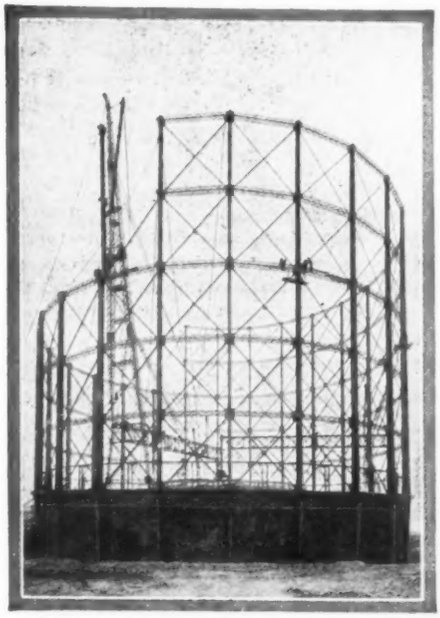
For many months, this machine has been running in the shops of the Western Gas Construction Company, Fort Wayne, Ind., giving it the most severe kind of usage in an endeavor to find the weakest points and to remedy any features that might interfere with its complete reliability.

In the Western "Mechanical Man" the control is used as a means of directing the water to the various hydraulic cylinders, eliminating all pilot valves and auxiliary cylinders, insuring rapid operating and simplicity of arrangement, and eliminating delicate and complex parts.

The use of oil in the timing medium has been found the best way to give the timing apparatus perfect flexibility. No other medium could possibly give the "Mechanical Man" its ability to gradually change the number of cycles by steps as small as desired by the superintendent, instead of going from five cycles per hour to six cycles, or to seven cycles, etc. The oil control also permits another desirable feature—dividing up any cycle into the desired percentage of blast, up run and down run, and finally only an oil control would enable the operator to retain the exact percentages desired of blast, up run and down run in each cycle, while gradually changing the number of cycles per hour.

Its operating test revealed the fact that the "Mechanical Man" is capable of an infinite variety of combinations of different periods of blasting time, down-run time and up-run time, and of practically any number, or fractional number, of cycles per hour. The machine is so arranged that it requires only a very simple operation to change any period, for example the blast period, which can be varied in steps of five seconds. It also has the completely new feature that once the percentage of blast, up run and down run, have been settled on as most advantageous for a certain kind of fuel, that the operator can gradually vary the number of cycles per hour without interfering with the relative percentage within the cycle until he has obtained a combination that gives the absolute maximum of capacity and economy.

The water supply for operating the several hydraulic lifts of the set is sent direct to the "Mechanical Man," which sends out the water direct to each of the hydraulic cylinders, entirely eliminating pilot valves and auxiliary cylinders and cutting out all hand-operated valves. This is a great advance over anything offered previously in giving the mechanical control a direct connection with each of the hydraulic cylinders. Built into the top of the machine is a large by-pass for the timing device, and with this is furnished a hand wheel



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with rack and pinion to provide for easy hand operation of the control. It was found it required only an instant to open the by-pass valve, and by means of the hand wheel put the set into the position for coaling or for emergency stops. It is intended that this hand control will be used in each charging period until the operator is satisfied that the fuel bed in the generator has been properly heated up, and that the secondary air in the carbureter was properly combined with the producer gas from the generator. After this it requires only the closing of the by-pass valve, and the "Mechanical Man" will immediately continue the cycle, finishing the blast and going on to the next run.

The machine is very compact and occupies only a small space above the floor. One of the new features is the steel box at the top which contains the mechanism for the recording device. The superintendent can throw the recording device into operation whenever he wishes, letting it run for several cycles and obtain an absolute, accurate indication of the time during which the machine was on any phase of the operation. It also provides a complete check on the operation of the control itself, enabling the superintendent to measure to within a few seconds the exact time required by each cycle. The recording apparatus can be operated continuously whenever desired

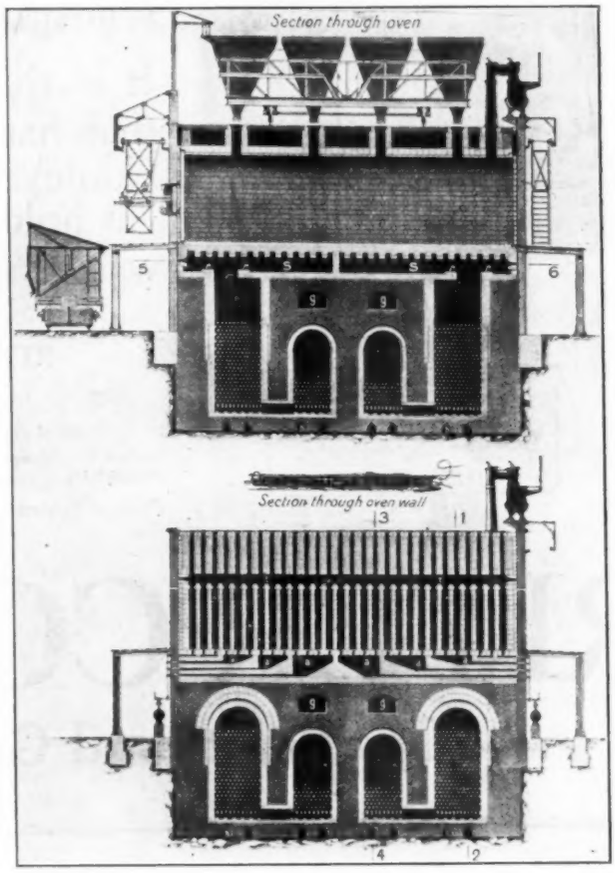
For the convenience of an operator who has charge of two or more sets there is provided an arrangement to display green, white and red lights indicating down runs, up runs and blast. These lights can be observed from quite a distance. It is also provided with a carefully marked gauge or scale on the "Mechanical Man" to show the operator precisely what position the water-gas set is in all the time.

This device will automatically take care of purging, split runs and blow runs to the exact amount desired by the management, relieving the operator of the great responsibility of these operations. It will also relieve him from the tiresome arithmetic continually required to enable him to keep track of the minutes and fractions for the different parts of each cycle.

This machine is manufactured by the Western Gas Construction Company, Fort Wayne, Ind.

Piette By-product Oven

The Belgian-American Coke Oven Corporation, New York, N. Y., was recently organized in the United States, for the construction of the several types of Piette System by-product coke ovens and recovering plants. In 1920 a demonstration plant was erected at the coke station of the Laclede Gas Light Company, St. Louis, Mo., and is of the by-products type with generators.



Piette By-Product Oven

They give the following description of this plant:

Their dimensions are:

Height under arch... 9 ft 10⅝ in.
Length between doors 37 ft.
Average width .....19¾ in.

This oven is with vertical flues, with regenerators acting transversely and with reversing device. The gas and the air enter in all the flues situated on one side of the inversion axis of the battery, along the coke side for a period of one-half hour and along the pusher side for the following half-hour period. The burnt gases travel downwards through all the flues situated on the other side of the inversion axis.

On the top of each vertical heating flue a regulation section of which the size has been carefully but definitely arranged at the time of the construction, connects the flue with a horizontal chamber (t) above.

On each side of the oven wall the gas is sent through four tuyeres to conduets located at the foot and in the axis of the oven wall. These conducts lead to distribution chambers (a) and each room feeds the burners of one set of three or four heating flues.

The combustion air circulates first in the galleries (g) and (h), where it is heated for the first time before entering the regenerators. The regenerating galleries extend over the whole length of the battery. Each regenerator is composed of two galleries located side by side, which galleries communicate with each other through numerous openings. One of the gal-

leries contains less checker brick work than its parent gallery and the space above said checker-work constitutes the air entrance conduct in one period of inversion and the burnt gas collector in the following period.

The flow of the air through the checker brick work, as well as the flow of the burnt gases travels therefore parallel to the axis of the oven and it is only in the free space of one of the two regenerating galleries that the flow of the gaseous currents travels longitudinally.

The sole flues (S) connect the regenerators with the foot of the oven wall.

The connecting channels between the regenerators and the sole flues are regulated by damper bricks (r).

Air nozzles connect the sole flues with the heating flues of the ovens.

Each part of the oven walls can be inspected through vertical flues existing in the top of the battery and which are closed by plugs.

A rapid control of the heating of each oven wall is facilitated by loopholes located on the front of the oven at the level of the horizontal room (h). Appropriate holes allow a quick inspection of the sole flues.

The color of the regenerators is easily watched through inspection holes situated at each end of the battery.

In a consecutive test they report the following results:

Mixture of coal charged—64 per cent Elkhorn; 35 per cent Pocahontas.

Average analysis of mixture:

	Per Cent
Moisture	4.433
On dry basis—	
Volatile matter	30.416
Ashes	5.378
Fixed carbon	64.208

Coking time—20 hr., 18 min.
Load per oven—26,770 lb.
Total yield in coke—69.19 per cent.
Average analysis of coke:

	Per Cent
Moisture	1.936
On dry basis—	
Ashes	6.900
Fixed carbon	92.110
Volatile matter	0.990

Total gas produced per pound of coal charged	5.849 cu. ft
Calorific value of this gas	564.5 B.t.u.

Yields in by-products, per ton of coal carbonized:

Ammonia, in pounds	5.632
Tar, in gallons	7.009
Benzol (product distilling below 200 deg. Cent.) in gallons	3.416

The Refinery Field Has New Development in Multiwhirl Subcooling Condenser

The Griscom-Russell Company, New York, has recently placed on the market the Multiwhirl Subcooling Condenser designed for use in oil refineries, particularly for the condensing and subcooling of gasoline, kerosene or any other vapors encountered in the refining process. The construction is clearly shown by the accompanying cut. The vapors to be condensed enter the tubes at the top and are condensed and cooled in their passage through the tubes and the resulting distillate is taken off at the bottom, the tubes being arranged single pass. The condensing and cooling water enters the shell at the bottom and travels upward through the helical path and leaves the condenser at the top, this arrangement insuring contraflow operation.

The unusual feature of this condenser is the patented helical baffle which insures a maximum length of water path for a given length of shell and a minimum water pressure loss. The helical baffle permits the use of a much smaller amount of condensing and cooling surface than is ordinarily required.

The efficient operation of the Multiwhirl Cooler permits delivery of the given cooling and condensing duty, using about one-third to one-quarter the condensing water required with other types of apparatus, with corresponding reduction in pumping costs.

The high efficiency of heat transfer results in a temperature of distillate within a few degrees of the condensing water supply.

Construction. — The Multiwhirl Subcooling Condenser is made standard with shell of close grain cast iron, and floating head of cast steel with floating head cover of either cast iron or cast steel. The tubes are of five-eighth-inch O. D. No. 16 B. W. G. seamless drawn steel expanded into tube sheets of rolled steel. The helical baffle is of brass. These materials of construction are varied to suit the requirements of the particular installations.

These condensers are built for both low or high pressure operations. They are especially well adapted to various cracking and topping systems.

Trade-Mark Name Contest

The Scott Gas Appliance Company, Inc., Bond Building, Washington, D. C., want suggestions for a trade-mark name for its new line of gas ranges. They state that the name must be short, easy to remember, easy to pronounce, and capable of being copyrighted. They offer prizes for the two best names submitted. They announce that the contest is open for everyone in the gas industry. It is now open and closes Nov. 11, 1921. Contestants may send in more than one suggestion. In the event of two or more persons submitting the names selected as the best or second best, each will receive the prize offered. They have ready to mail to contestants what they term a "suggestion slip," and an "identification slip," which give all the details regarding prizes, rules, etc., and copies will be mailed on request. The suggestion slips can either be mailed to the company office, Washington, D. C., or left at their booth, No. 17, at the American Gas Association convention, Congress Hotel, Chicago, Ill., to be held Nov. 7 to 12, 1921.

May Sell Out Gas Plant

Whether a public utility corporation can be sold out like any other delinquent for taxes is a question that is now giving local officials much concern. A list of properties advertised for sale for unpaid taxes includes that of the New Jersey Gas Company. The company, whose central plant here supplies more than seventy south Jersey towns with gas, was recently placed under a receivership. It owes the borough a total of $6,376.67 in back taxes.

The tax sale was scheduled for last week, but Tax Collector Arthur W. Magee announced postponement for thirty days. He said he had looked up the laws and could not find where public utility companies were treated any differently from other property owners who fail to pay their taxes.

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WANTED—Position by reliable man, twelve years' experience in manufacturing and distribution of gas. Small town preferred. Excellent references. Address Box 464, care of the American Gas Journal.

DIVIDEND NOTICE

Office of
The United Gas Improvement Co.
N. W. Corner Broad and Arch Streets
Philadelphia, Sept. 14, 1921.

The Directors have this day declared a quarterly dividend of one per cent. (50c. per share) on the Common Stock of this Company, payable Oct. 15, 1921, to holders of Common Stock of record at the close of business Sept. 30, 1921. Checks will be mailed.

I. W. MORRIS, Treasurer.

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